

AMERICAN JOURNAL OF PUBLIC HEALTH *and* THE NATION'S HEALTH

VOLUME 28, 1938

INDEX

	Pages		Pages
January	1-116	July	807- 906
February	117-240	August	907-1028
March	241-422	September	1029-1152
April	423-557	October	1153-1268
May	559-693	November	1269-1368
June	695-806	December	1369-1456
Year Book 1937, 1938.....		Supplement to February Journal	
Preliminary Program, Sixty-sixth Annual Meeting.....		Supplement to August Journal	

AMERICAN PUBLIC HEALTH ASSOCIATION
50 WEST 50TH STREET
NEW YORK, N. Y.

S. M. S. MEDICAL COLLEGE,

LIBRARY,

J. R. No...5248..

Date... 8-4-65...

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

January, 1938

Number 1

CONTENTS

	PAGE
An Equal Opportunity for Health <i>The Honorable Herbert H. Lehman</i>	1
The Familial Aggregation of Infectious Diseases <i>Wade H. Frost, M.D.</i>	7
A State Cancer Program <i>Henry D. Chadwick, M.D., and Herbert L. Lombard, M.D.</i>	14
Diabetes—An Important Public Health Problem <i>Charles F. Bolduan, M.D.</i>	21
Allocation of Deaths <i>Medical Officer (London)</i>	27
Determining Population in Intercensal and Postcensal Years by Means of Continuous Population Registers <i>Dorothy Swaine Thomas, Ph.D.</i>	28

Continued on page vi

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

Published by the American Public Health Association, 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States; \$5.50 for Canada, Cuba, and Mexico; and \$6.00 for foreign countries. Single copies, 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor in Chief, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 West 50th Street, New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Announcing

PERTUSSIS ANTIGEN (Detoxified)

Lederle

THIS new form of therapy is recommended for the treatment of active cases of Whooping Cough as well as in general prophylaxis.

Free from bacterial cells, "Pertussis Antigen (Detoxified) *Lederle*" is a departure from the usual form of vaccine therapy. Based upon a toxic principle derived from *H. pertussis*, treatment with formalin converts the toxic factor into a non-toxic substance having antigenic properties.

If used early in *treatment* or soon after exposure, the immunological response is sufficiently rapid to modify or prevent, respectively, the disease in the majority of cases, as evidenced by the following:

49 of 53 cases treated during the first or second week did not develop whooping or vomiting.

Of 70 cases treated during the third or fourth week, 30 became symptom-free after the completion of injections, while the remainder showed marked improvement but continued to run a mild, modified course of whooping cough. Cases treated during the fifth week showed no benefit.

When used for *prevention*, only 3 out of 140 developed the disease and those 3 were mild atypical cases.

Packages

3 vials—2 cc. each
1 vial—10 cc.



LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA
NEW YORK, N. Y.

Epidemic Diarrhea of the New-Born—III. Epidemiology of Outbreaks of
Highly Fatal Diarrhea Among New-Born Babies in Hospital
Nurseries 36
Samuel Frant, M.D., and Harold Abramson, M.D.

Experiments on Antirabic Vaccination With Tissue Culture Virus . . . 44
Leslie T. Webster, M.D.

Relation of Lymphocytic Choriomeningitis to Acute Aseptic Meningitis
(Wallgren) 47
R. D. Baird, M.D., and Thomas M. Rivers, M.D., Sc.D.

Difficulties Encountered in Pneumococcal Type Determination 54
Annabel W. Walter

Alpha Hemolytic Streptococci of Air: Their Variant Forms, Origin and
Numbers per Cubic Foot of Air in Several Types of Locations . . . 61
*Leon Buchbinder, Ph.D., Mathilde Solowey, and
Morris Solotorovsky*

Nutrition and Dental Caries 72
Bion R. East, D.D.S.

EDITORIALS:

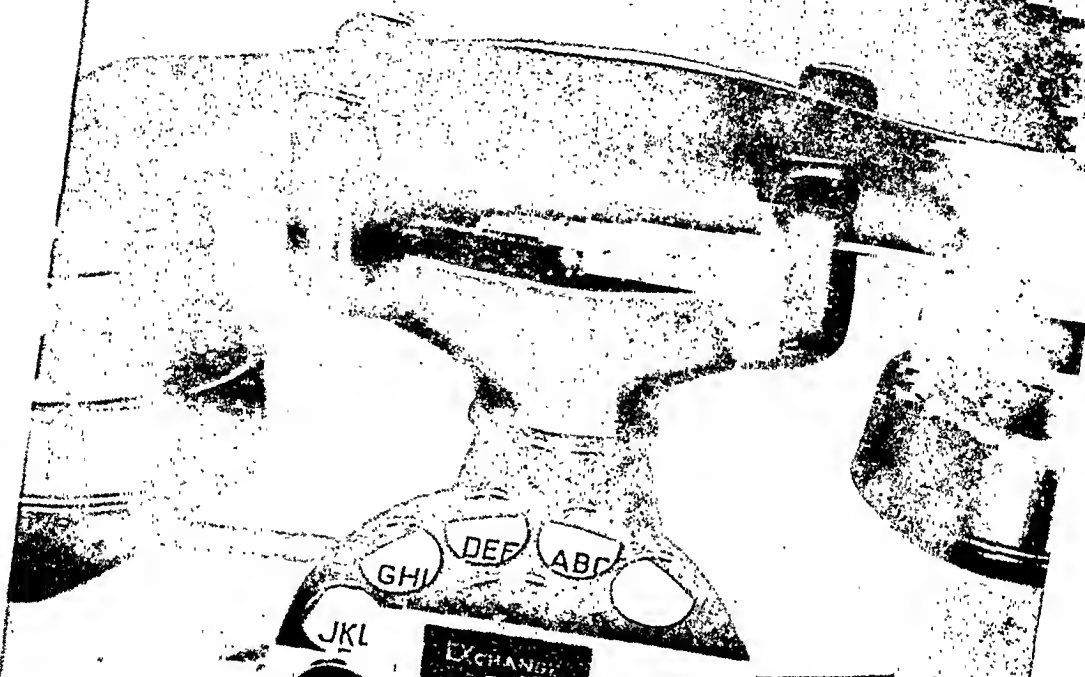
Vinson-Barkley Bill 77
Standard Birth and Death Certificates 79

Continued on page viii

Reprint prices furnished upon request

RELIABLE ADVERTISEMENTS

MORE SERVICE FOR MORE PEOPLE



There are more Bell telephones today than ever.

More people can talk with you and you can

talk with more people. Bell telephone service

gives you more value now than ever before.

BELL TELEPHONE SYSTEM



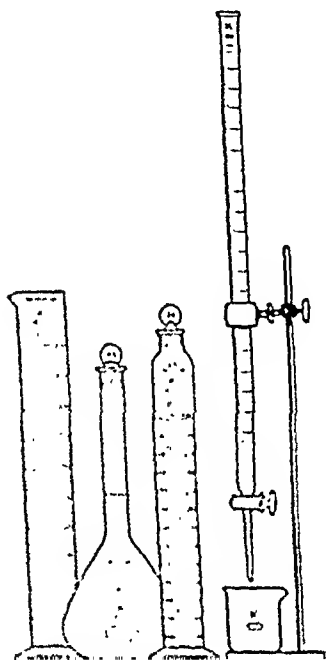
Contents—Continued

	PAGE
Public Health Education— <i>Evart G. Rontzahn</i>	80
Annual Index of Journal. Children Have the Last Word. A Significant Amalgamation. Again the March of Time. A Junior Board of Directors. "Any Number of Wives." Workers Health Education. "Your Health" Continues. "Ye Greate Stinking Poisonous Weed." A School Safety Display. When You Get to New York. Publicity Against Syphilis. The Health Officer Reports. Health Education in November, 1937, Journal. Hygeia, December, 1937. Letters and Good Will. Health in Newspapers—Part 2. National Health Library. Motion Pictures. Schools and Children. Reporting. Dates Ahead. For Reference or Education. Conventions Past and Future. Magazine Articles.	
Books and Reports	95
Clinical Parasitology. Feeding Behavior of Infants. Anatomy and Physiology of Physical Training. Some Fundamental Aspects of the Cancer Problem. Malaria in Europe. Childbirth Yesterday and Today. Safety Through Childbirth. Textbook of Psychiatry (2nd ed.). Junior Clothing (rev. ed.). Junior Foods (rev. ed.). Principles and Practice of Public Health Dentistry. Research Memorandum on Social Aspects of Health in the Depression. Research Memorandum on Crime During the Depression. Federal and State Control of Milk Prices. An Introduction to the Social Studies. Russian Medicine (Clio Medica).	
Books Received	103
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . .	104
Association News	106
Executive Board Meeting. Applicants for Membership.	
Employment Service	109
News from the Field	110
Conferences and Dates	114

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.	X	Federation of Sewage Works Associations	XXI
Book Service	XIV, XVII, XVIII	Gilliland Laboratories, Inc. The	II
Gifts and Bequests	XX	International Equipment Co.	XIX
Membership Application Form	XII	Kimble Glass Company	VII
Affiliated Societies and Branches	XII	Lederle Laboratories, Inc.	III
American Can Company	XXIII	National Drug Company, The	XV
American Telephone & Telegraph Co.	V	National Organization for Public Health Nursing	XVII
Bell Telephone System	V	New York State Journal of Medicine	XIX
Canadian Public Health Association	XVIII	Public Health Nursing	XVII
Corning Glass Works	XIII	Pyrex Laboratory Glassware	XIII
Difco Laboratories, Inc.	Back cover	Sewage Works Journal	XXI
Directory of Health Service	XXII	Squibb, E. R., & Sons	IX
American Water Works Association		Trained Nurse, The	XXI
Bendiner & Schlesinger Laboratories		United Fruit Company	XI
Black & Veatch		Wallace & Tiernan Co., Inc.	XX
Book Service, A.P.H.A.			
Committee on Administrative Practice, A.P.H.A.			

**SAFETY and
CONTROL**



for Assurance



**IN THE GREAT
DAIRY INDUSTRIES**

One of the most far-reaching and envied assets of the nation is its vast Dairy Industry, producing almost 110,000,000,000 pounds of whole milk each year. 20% of the consumer's food dollar goes for milk and milk products—more than \$385,000,000 in butter, \$57,000,000 in cheese, \$131,000,000 in condensed and evaporated milk. All told, this amazing industry tips the financial scales at about \$4,000,000,000 a year!

Kimble Blue Line Exax Glassware is a very definite and vital factor in helping maintain the rigid control and high quality of dairy products. The accuracy of Blue Line Exax in test, analysis and research—whether in dairy laboratories, or in chemical or industrial plants, clinical or medical institutions—gives that ASSURANCE so essential to scientific success.

Standardize, for safety and service, on Blue Line Exax—with its brilliant BLUE fused-in calibrations, its retested, annealed and strain-free construction—for all chemical, biological and clinical determinations.

*Stocked by leading Laboratory Supply Houses
throughout the United States and Canada*



The Visible Guarantee of Invisible Quality

KIMBLE GLASS COMPANY VINELAND, N. J.
NEW YORK . . CHICAGO . . PHILADELPHIA . . DETROIT . . BOSTON

Kimble Glass Company, Vineland, N. J.

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28 February, 1938 Number 2

CONTENTS	
	PAGE
Health Education for the Millions	117
<i>Louis I. Dublin, Ph.D., and Homer N. Calver</i>	
Scarlet Fever Immunization with Formalinized Toxin: A Preliminary Report	123
<i>Gaylord W. Anderson, M.D.</i>	
Result of Active Immunization of Nurses Against Scarlet Fever	137
<i>Edwin H. Place, M.D.</i>	
Sanitary Aspects of Air Conditioning	143
<i>C. P. Yaglou</i>	
Standard Agar Counts as Compared With Counts on Improved Agars at 32° C.	148
<i>M. W. Yale, Ph.D.</i>	
Syphilis Control in Industry	155
<i>R. R. Sayers, M.D.</i>	
<i>Year Book 1937-1938</i>	<i>Supplement</i>
<i>Continued on page vi</i>	

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

"Early" is the watchword in

PNEUMONIA CONTROL

IN A RECENT ISSUE OF THE HEALTH OFFICER, the following watchwords were promulgated for the control of pneumonia:

"*Early* diagnosis, *early* typing and *early* serum treatment mean *early* recovery."

The importance of *early typing* cannot be over-emphasized, for it not only serves to identify the specific etiologic agent of the pneumonia, but frequently, and especially in atypical pneumonias, it also aids in fixing the diagnosis and makes possible the early administration of specific serum.

The Neufeld Rapid Typing reaction should be applied to the patient's sputum immediately upon suspicion of lobar or bronchial pneumonia.

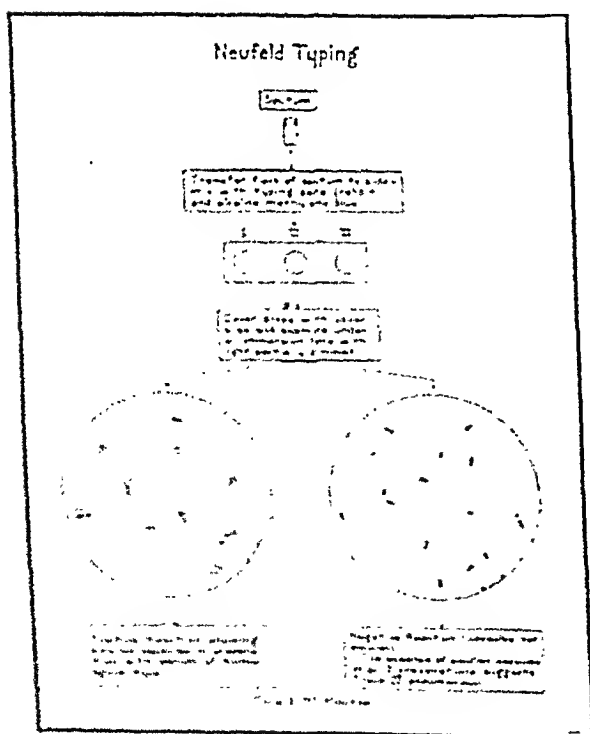
"Pneumococcus Typing Serum Lederle" Types 1 to 32 for the Neufeld Reaction, ready for immediate use, are available in 1.0 cc. vials and in packages of 5 capillary tubes for individual tests.

An editorial in the December 4, 1937 issue of the Journal of the American Medical Association states:

"In view of the distribution of pneumonia and the known effectiveness of serum when given early in the most fatal types, the facilities for typing are of the utmost importance."

A printed list of 2000 laboratories in the United States and Canada to which sputum may be referred by practitioners for typing has been published in directory form by Lederle and may be obtained free on request to

LEDERLE LABORATORIES, INC.
75 ROCKEFELLER PLAZA
NEW YORK



<i>Contents—Continued</i>	PAGE
Comparative Methods of Diagnosis of Rabies in Animals <i>Charles N. Leach, M.D.</i>	162
Tuberculosis Among Children and Young People in Cattaraugus County, N. Y. <i>John H. Korns, M.D.</i>	167
Use of Dishwashing Machines: Pasteurization of Eating Utensils <i>Wesley C. Cox, M.D.</i>	174
The Rôle of the Nurse in the Control of Syphilis and Gonorrhea <i>Gladys L. Crain, R.N.</i>	181
A Suggested Program of Control of Amebiasis by Health Departments . . <i>Charles F. Craig, M.D.</i>	187

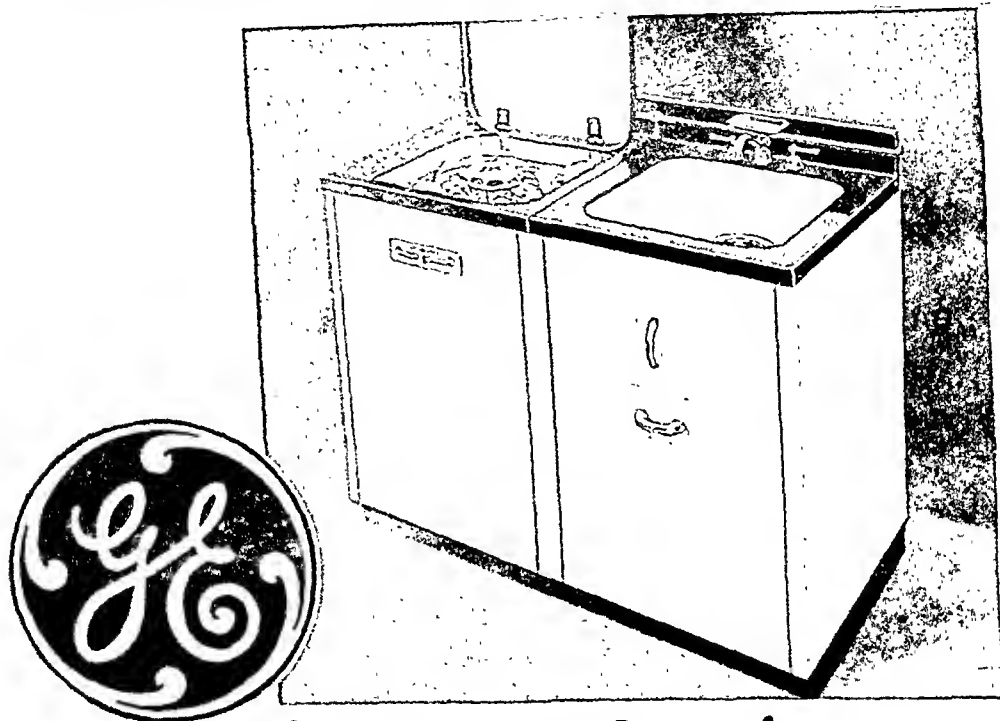
EDITORIALS:

Public Health Expanding	193
Air-Borne Infection	195
Dr. Lawrason Brown	198
Journal Policy	198
What We Owe to Veterinary Medicine	199
Public Health Education— <i>Evert G. Routzahn</i>	201
Read It Before You Print It. "Your Health" Broadcasts Continue. How It Has Been Written. Expansion in Canada. "Musclebound with Caps." Inter- preting Your Illustrative Cases. Holiday Greetings. Health Education First by Television. "Making Bibliographies Alive." Health in Newspapers: Part 3. In Cities of 10,000 or More. A Week and Six Months. Not Too Old to Learn. Something Has Been Started. Drama and News by Radio. Health Clubs for Negro Women. Again Education Is Needed. Eleven Slogans. Learning Versus Teaching. Leadership in the Berkshires. Hygeia, January, 1938. Tell the Public What You Do. Dates Ahead. Commercial Gadgets. Magazine Articles. Motion Pictures. New. Radio. Exhibits.	

Continued on page viii

Reprint prices furnished upon request

PROMOTES HEALTH AND SANITATION IN THE HOME



Electric Sink..

WITH DISHWASHER AND DISPOSALL

Washes and Dries the Dishes Hygienically Clean... Quickly Disposes of Kitchen Food Waste at the Sink

• The General Electric Sink "does the dishes" and disposes of food waste electrically. Dishes, silverware, pots and pans are cleaned hygienically in water at pasteurization temperature—140 to 160 degrees—far hotter than human hands can stand. Dishes and utensils dry in their own heat. No unsanitary dishcloths! All food wastes—even chop bones—go down the drain into the Disposall where they are

shredded to a thin pulp and flushed away like water. No more messy garbage! No more odors! No more disagreeable trips outdoors to the germ-breeding garbage can! The G-E Dishwasher may be installed as a separate cabinet and the G-E Disposall can be attached to almost any home sink. The G-E Electric Sink combines Dishwasher and Disposall. It's the sanitary, work- and time-saving way to take care of the two most unpleasant kitchen tasks. Let us send complete details. Write today to General Electric Company, Section AJ2, Nela Park, Cleveland, Ohio.

GENERAL  ELECTRIC

Contents—Continued

	PAGE
Books and Reports	213
Public Medical Services: A survey of tax-supported medical care in the United States. Phenomenon of Local Tissue Reactivity and Its Immunological, Pathological and Clinical Significance. Pathology (Clio Medica). The Baby's First Two Years (4th ed.). Man, Bread and Destiny. The Measurement of Outcomes of Physical Education for College Women. Proceedings of the 1936 Annual Conference of the National Society for the Prevention of Blindness. Child Psychology. First Aid Textbook—American Red Cross (rev. ed.). Handbook of Hygiene (5th ed.). Take Care of Yourself: A Practical Guide to Health and Beauty. Socialized Medicine in the Soviet Union. Federal and State Control of Milk Prices. The Pneumonokonioses (Silicosis): Literature and Laws—Book III. School Nursing: A Contribution to Health Education (2nd ed.).	
Books Received	221
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . .	222
Association News	225
Applicants for Membership. Royal Sanitary Institute.	
Employment Service	227
News from the Field	229
Conferences and Dates	239

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.....	XII	Federation of Sewage Works Associations..	XXIV
Book Service	XVI, XXI	Eimer & Amend.....	XXIII
Gifts and Bequests.....	XXII	Everson Mfg. Co.....	XXI
Membership Application Form.....	XIV	General Electric	V
Affiliated Societies and Branches.....	XIV	Gilliland Laboratories, Inc., The.....	II
American Can Company.....	XXVII	Lederle Laboratories, Inc.....	III
Canadian Public Health Association.....	XXV	National Drug Company, The.....	XIII
Cereal Soaps Co., Inc.....	XXV	National Organization for Public Health	
Cocomalt	XVII	Nursing	XXIII
Davis, R. B., Co.....	XVII	Philip Morris & Co.....	VII
Derbac	XXV	Sewage Works Journal.....	XXIV
Difco Laboratories, Inc.....	Back Cover	Spencer Lens Company.....	VII
Directory of Health Service.....	XXVI	Squibb, E. R., & Sons.....	XV
American Water Works Association		Trained Nurse, The.....	XXIV
Bendiner & Schlesinger Laboratories		Wallace & Tiernan Co., Inc.....	XX
Black & Veatch		Wisconsin Alumni Research Foundation....	XIX
Committee on Administrative Practice,		World Peaceways, Inc.....	XXIII
A.P.H.A.			
Information Service, A.P.H.A.			



DARK FIELD

The program of the national public health service for the eradication of syphilis includes widespread use of the dark-field test for *Treponema pallida*. This promotion of a microscopic technique emphasizes the general value of advancement in optical science.

Spencer scientists and craftsmen whose products have earned the special praise of technicians in dark-field work, are consistently advancing the optical quality of all Spencer instruments.

In every application of microscopy the Spencer standard of "Optical Quality First" merits your attention.

Spencer Lens Company

MICROSCOPES
MICROTOMES
PHOTO-
MICROGRAPHIC
EQUIPMENT



REFRACTOMETERS
COLORIMETERS
SPECTROMETERS
PROJECTORS

PROVED DEFINITELY LESS IRRITATING

CIGARETTES made by the ordinary method of manufacture produce an irritation of the nose and throat that is noticeably absent when smoking Philip Morris.

Scientific research* shows that cigarettes in which diethylene glycol is used, are definitely less irritating—a major improvement in cigarettes.

In Philip Morris diethylene glycol is used exclusively as the hygroscopic agent.

PHILIP MORRIS & CO.



PHILIP MORRIS & CO. Ltd. Inc.
119 Fifth Avenue New York

Please send me reprints of papers from

- ★Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245 ☐
- Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154 ☐
- N.Y. State Jour. Med., June 1935, Vol. 35, No. 11 ☐
- Laryngoscope, Jun. 1937, Vol. XLVII, No. 1, 58-60 ☐

SIGNED: _____

ADDRESS _____

CITY _____ STATE _____

PHM

CONTENTS OF

YEAR BOOK OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

1937-1938

(See Supplement)

	PAGE
Governing Council, American Public Health Association	1
Constitution and By-Laws, American Public Health Association	2
Annual Meetings	9
Presidents of the American Public Health Association	11
Recognition for Extended Membership	11
Recipients of the Sedgwick Memorial Medal	11
Executive Staff	12
Editorial Board, <i>American Journal of Public Health</i>	12
Publications	12
Section Councils	13
Committee List, 1937-1938	15
Affiliated State Public Health Societies	29
Western Branch	31
Southern Branch	31
Resolutions Adopted by the Governing Council October 7, 1937	32
The Health Conservation Contests	38

REPORTS OF COMMITTEES

ANNUAL MEETING:	
Scientific Exhibits	42
Homer N. Calver, <i>Chairman</i>	
CHILD HYGIENE:	
Public Health Dentistry	44
Guy S. Millberry, D.D.S., <i>Chairman</i>	
School Health Service	47
Harold H. Mitchell, M.D., <i>Chairman</i>	
FOOD AND NUTRITION:	
Analyzing Frozen Desserts and Ingredients	49
J. H. Shrader, Ph.D., M.D., <i>Chairman</i> , and Friend Lee Mickle, Sc.D., <i>Chairman</i> (Laboratory Section Committee)	
Foods (Chemical Contamination of Food)	52
Albert C. Hunter, Ph.D., <i>Chairman</i>	
Microbiological Methods of Food Examination (Development of Standard Methods for the Microbiological Examination of Foods)	56
Lawrence H. James, Ph.D., <i>Chairman</i>	
Milk and Dairy Products	66
Frederick W. Fabian, Ph.D., <i>Chairman</i>	
Nutritional Problems (Extent of Vitamin Deficiency in the United States)	75
D. Breese Jones, Ph.D., <i>Chairman</i>	

Ventilation and Atmospheric Pollution

Emery R. Hayhurst, M.D., Ph.D., *Chairman*

Part I—Working Standards	81
Part II—Standard Methods for the Examination of the Air	82
I. Report of Sub-Committee on Physical Procedures in Air Analysis	82
C. P. Yaglou, <i>Chairman</i>	
II. Report of Sub-Committee on Chemical Procedures in Air Analysis	83
Warren A. Cook, <i>Chairman</i>	
III. Report of Sub-Committee on Dust Procedures in Air Analysis (Review and Discussion of Methods of Analyzing Industrial Dusts)	85
J. J. Bloomfield, <i>Chairman</i>	
IV. Report of Sub-Committee on Bacteriological Procedures in Air Analysis (Analytic Bacteriological Procedures)	87
William F. Wells, <i>Chairman</i>	

LABORATORY:

The Laboratory Section of the American Public Health Association (Report of the Archivist)	92
Augustus B. Wadsworth, M.D.	
Progress in and Present Status of Biological Products	95
Elliott S. Robinson, M.D., Ph.D., <i>Chairman</i>	
Standard Methods (Coördinating Committee)—Report of the Chairman	95
A. Parker Hitchins, M.D. <i>Chairman</i>	
Standard Methods on Analyzing Frozen Desserts (Analyzing Frozen Desserts and Ingredients)	98
Friend Lee Mickle, Sc.D., <i>Chairman</i> , and J. H. Shrader, Ph.D., M.D., <i>Chairman</i> (Food and Nutrition Section Committee)	
Standard Methods on Biology of the Laboratory Animal	101
R. A. Kelser, D.V.M., <i>Chairman</i>	
Standard Methods on the Examination of Dairy and Food Products (Bacterio- logical Examination of Dairy Products)	102
Robert S. Breed, Ph.D., <i>Chairman</i>	
Standard Methods on Diagnostic Procedures and Reagents	103
William D. Stovall, M.D., <i>Chairman</i>	
Recognition and Significance of Hemolytic Streptococci in Infectious Diseases (Evaluation of the Group Precipitation Test in the Identification of Hemolytic Streptococci Pathogenic for Man)	104
Julia M. Coffey, <i>Referee</i>	
Recognition of Pneumococcus Types Associated with Pneumonia	108
Elliott S. Robinson, M.D., Ph.D., <i>Referee</i>	
Serological and Bacteriological Procedures in the Diagnosis of Enteric Fevers	111
Marion B. Coleman, <i>Referee</i>	
Serological Tests for the Diagnosis of Syphilis	112
Ruth Gilbert, M.D., <i>Referee</i>	
Serological Tests for the Diagnosis of Syphilis	114
Elizabeth Maltaner, <i>Associate Referee</i>	
Standard Methods on Examination of Water and Sewage (Water Analysis)	118
John F. Norton, Ph.D., <i>Chairman</i>	

(Continued on next page)

PUBLIC HEALTH ENGINEERING:	PAGE
Bathing Places Warren J. Scott, <i>Chairman</i>	119
Milk Supply Walter von D. Tiedeman, <i>Chairman</i>	124
Sewage Disposal (The Value of Sewage Sludge as a Fertilizer) Langdon Pearse, <i>Chairman. Sewage Works Journal</i> , November, 1937	
Shellfish L. M. Fisher, D.P.H., <i>Chairman</i>	126
Summer Camps and Roadside Places (Trailer Camp Sanitation) Carl E. Green, <i>Chairman</i> Trailer House Statistics—August, 1937, September, 1937	132
Water Supply (Water-Borne Outbreaks in the United States and Canada, 1930- 1936, and Their Significance) Arthur E. Gorman, <i>Chairman</i>	137
PUBLIC HEALTH NURSING:	
To Study Relationships Between Official and Nonofficial Public Health Nursing Agencies Miriam Ames, R.N., <i>Chairman</i>	157
VITAL STATISTICS:	
Accident Statistics Robert J. Vane, <i>Chairman</i>	160
Death Certification Marjorie T. Bellows, <i>Chairman</i>	162
Forms and Methods of Statistical Practice (Age Adjustment of Death Rates) . . A. W. Hedrich, Sc.D., <i>Chairman</i>	164

THE AMERICAN PUBLIC HEALTH ASSOCIATION

50 West 50th Street, New York, N. Y.

GOVERNING COUNCIL

OFFICERS 1937-1938

President, ARTHUR T. MCCORMACK, M.D., Louisville, Ky.
President-Elect, ABEL WOLMAN, Dr.Eng., Baltimore, Md.
First Vice-President, JOHN L. RICE, M.D., New York, N. Y.
Second Vice-President, J. T. PHAIR, M.D., D.P.H., Toronto, Ont., Can.
Third Vice-President, DOMINGO F. RAMOS, M.D., Havana, Cuba
Treasurer, LOUIS I. DUBLIN, Ph.D., New York, N. Y.
Executive Secretary, REGINALD M. ATWATY, M.D., New York, N. Y.
Chairman of Executive Board, JOHN A. FERRELL, M.D., New York, N. Y.

Terms Expiring 1938

E. L. BISHOP, M.D., Knoxville, Tenn.
 ROBERT D. DEFRIES, M.D., Toronto, Ont., Can.
 JOHN A. FERRELL, M.D., New York, N. Y.
 C. A. HOLMQUIST, Albany, N. Y.
 JOHN F. NORTON, Ph.D., Kalamazoo, Mich.
 MAZIEK P. RAVENEL, M.D., Columbia, Mo.
 W. FRANK WALKER, Dr.P.H., New York, N. Y.
 CHARLES F. WILINSKY, M.D., Boston, Mass.
 ABEL WOLMAN, Dr.Eng., Baltimore, Md.
 C. C. YOUNG, D.P.H., Lansing, Mich.

Terms Expiring 1939

EARLE G. BROWN, M.D., Arlington, Va.
 WALTER H. BROWN, M.D., Palo Alto, Calif.
 A. J. CHESLEY, M.D., St. Paul, Minn.
 J. C. GEIGER, M.D., San Francisco, Calif.
 PEARL McIVER, R.N., Washington, D. C.
 ARTHUR P. MILLER, C.E., New York, N. Y.
 HARRY S. MUSTARD, M.D., Baltimore, Md.
 STANLEY H. OSBORN, M.D., Hartford, Conn.
 GEORGE H. RAMSEY, M.D., Albany, N. Y.
 HENRY F. VAUGHAN, Dr.P.H., Detroit, Mich.

Terms Expiring 1940

W. F. DRAFER, M.D., Washington, D. C.
 A. GRANT FLEMING, M.D., D.P.H., Montreal, Que., Can.
 IRA V. HISCOCK, New Haven, Conn.
 E. V. MCCOLLUM, Ph.D., Baltimore, Md.
 J. T. PHAIR, M.B., D.P.H., Toronto, Ont., Can.
 JOHN L. RICE, M.D., New York, N. Y.
 GEORGE C. RUHLAND, M.D., Washington, D. C.
 WILLIAM P. SHEPARD, M.D., San Francisco, Calif.
 WILSON G. SMILLIE, M.D., New York, N. Y.
 HUNTINGTON WILLIAMS, M.D., Baltimore, Md.

REPRESENTATIVES OF AFFILIATED SOCIETIES AND BRANCHES

L. J. DUMONT, M.D., Connecticut Public Health Association
 William H. Pickett, M.D., Florida Public Health Association
 M. E. WINCHESTER, M.D., Georgia Public Health Association
 HENRY D. CHADWICK, M.D., Massachusetts Public Health Association
 C. C. SLEMONS, M.D., Michigan Public Health Association
 MERL P. MOON, Ph.D., Missouri Public Health Association
 JAMES R. SCOTT, M.D., New Mexico Public Health Association
 I. O. CHURCH, M.D., Northern California Public Health Association
 G. D. LUMMIS, M.D., Ohio Federation of Public Health Officials
 HENRY FIELD SMYTH, M.D., Pennsylvania Public Health Association
 MARGARET W. BARNARD, M.D., Public Health Association of New York City
 RAYMOND V. STONE, D.V.M., M.D., Southern California Public Health Association
 JAMES A. HAYNE, M.D., South Carolina Public Health Association
 V. M. EHLERS, Texas Public Health Association
 W. BROWNLEY FOSTER, M.D., Virginia Public Health Association
 JESSE H. CROUCH, M.D., West Virginia Public Health Association
 J. J. SIPPY, M.D., Western Branch
 F. J. UNDERWOOD, M.D., Southern Branch

SECTION OFFICERS

Health Officers

Chm., GEORGE F. AMYOT, M.D., D.P.H., New York, N. Y.
Vice-Chm., J. N. BAKER, M.D., Montgomery, Ala.
Secy., PAUL BROOKS, M.D., Albany, N. Y.
Section Council, S. BOUCHES, M.D., Montreal, Que., Can.
 A. H. FLICIEWICZ, M.D., Fort Worth, Tex.
 EDWARD S. GODFREY, Jr., M.D., Albany, N. Y.
 JOHN P. KOEHLER, M.D., Milwaukee, Wis.
 FREDERICK D. STRICKER, M.D., Portland, Ore.

Laboratory

Chm., FRIEND LEE MICKLE, Sc.D., Hartford, Conn.
Vice-Chm., THOMAS F. STILES, M.D., Atlanta, Ga.
Secy., GEORGE D. CEMINSKY, Ph.D., Lansing, Mich.

Vital Statistics

Chm., JESSAMINE S. WHITNEY, New York, N. Y.
Vice-Chm., A. W. HEDRICH, Sc.D., Baltimore, Md.
Secy., JOHN COLLINSON, M.D., Washington, D. C.

Public Health Engineering

Chm., MAJOR JOEL I. CONNOLLY, Chicago, Ill.
Vice-Chm., ROY J. MORTON, Nashville, Tenn.
Secy., JAMES LLOYD BARKON, C.E., White Plains, N. Y.

Industrial Hygiene

Chm., J. J. BLOOMFIELD, Washington, D. C.
Vice-Chm., CLARENCE D. SELEY, M.D., Detroit, Mich.

Secy., W. J. MCCONNELL, M.D., New York, N. Y.

Food and Nutrition

Chm., BERNARD E. PROCTOR, Ph.D., Cambridge, Mass.
Vice-Chm., D. BREESE JONES, Ph.D., Washington, D. C.

Secy., CARL R. FELLERS, Ph.D., Amherst, Mass.

Child Hygiene

Chm., DON W. GUDAKUNST, M.D., Detroit, Mich.
Vice-Chm., GUY S. MILLFERRY, D.D.S., San Francisco, Calif.

Secy., ESTELLA F. WARNER, M.D., Albuquerque, N. M.

Public Health Education

Chm., MARY P. CONNOLLY, Detroit, Mich.
Vice-Chm., CLAIR E. TURNER, Dr.P.H., Cambridge, Mass.

Secy., CARL WILZBACH, M.D., Cincinnati, Ohio

Public Health Nursing

Chm., MARY J. DUNN, R.N., Washington, D. C.
Vice-Chm., MARGUERITE A. WALES, R.N., Battle Creek, Mich.

Secy., RUTH HOULTON, R.N., New York, N. Y.

Epidemiology

Chm., JAMES A. DOULL, M.D., Dr.P.H., Cleveland, Ohio
Vice-Chm., CLARENCE L. SCAMMAN, M.D., New York, N. Y.

Secy., FILIP C. FORSBECK, M.D., Lansing, Mich.

Executive Board

Chairman, JOHN A. FERRELL, M.D., New York, N. Y. (1939)

J. N. BAKER, M.D., Montgomery, Ala. (1939)

LOUIS I. DUBLIN, Ph.D., New York, N. Y. (1938)

(*Treasurer*) JOHN P. KOEHLER, M.D., Milwaukee, Wis. (1940)

ARTHUR T. MCCORMACK, M.D., Louisville, Ky. (1938)

(*President*) THOMAS FARRAN, M.D., Washington, D. C. (1940)

JOHN L. RICE, M.D., New York, N. Y. (1938)

HUNTINGTON WILLIAMS, M.D., Baltimore, Md. (1938)

ABEL WOLMAN, Dr.Eng., Baltimore, Md. (*President-Elect*)

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

March, 1938

Number 3

CONTENTS

	PAGE
Mental Hygiene and the Health Department	241
<i>Allen W. Freeman, M.D.</i>	
Is There an Epidemiology of Mental Disease?	245
<i>Henry B. Elkind, M.D.</i>	
Achievements in Mental Hygiene and Promising Leads for Further Endeavor	251
<i>C. M. Hincks, M.D.</i>	
Relationship of Maternal and Child Health to the General Health Program	256
<i>Thomas Parran, M.D.</i>	
Essentials of an Effective State Plan and Program of Activities for Flood Sanitation	263
<i>C. W. Klassen and Arthur P. Miller, C.E.</i>	
Discussion— <i>F. C. Dugan, C.E.</i>	276
Visual Education for Schools	278
<i>Pauline Brooks Williamson</i>	
Adaptation of the International List of Causes of Death to Changing Needs of the Medical Profession and Public Health Groups	283
<i>Halbert L. Dunn, M.D., Ph.D.</i>	

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazýck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Reducing the risk
of severe serum reactions in

SCARLET FEVER ANTITOXIN THERAPY

TIME WAS WHEN PHYSICIANS confronted with a case of scarlet fever felt themselves in a dilemma. The use of antitoxin meant a serious risk of serum reactions; withholding it left the patient in danger.

Antitoxin was, therefore, frequently given only in severe cases; with the result that many of the milder cases progressed to the severe form of the disease, with a lower expectancy of effectiveness of serum therapy when instituted late.

The advent of "Globulin Modified Scarlet Fever Streptococcus Antitoxin *Lederle*" has changed the old attitude towards antitoxin therapy.

This potent antitoxin with its greatly reduced liability to cause reactions is now being widely used regardless of apparent mildness of attack. The decrease in the incidence of serious complications alone, aside from the favorable effect on the prognosis, far over-balances the lingering hazards involved in the 25% incidence of severe serum reactions following the use of this antitoxin.

"Scarlet Fever Streptococcus Antitoxin (Globulin Modified) *Lederle*" is available in appropriate packages for both prophylaxis and therapy.

Lederle

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA NEW YORK

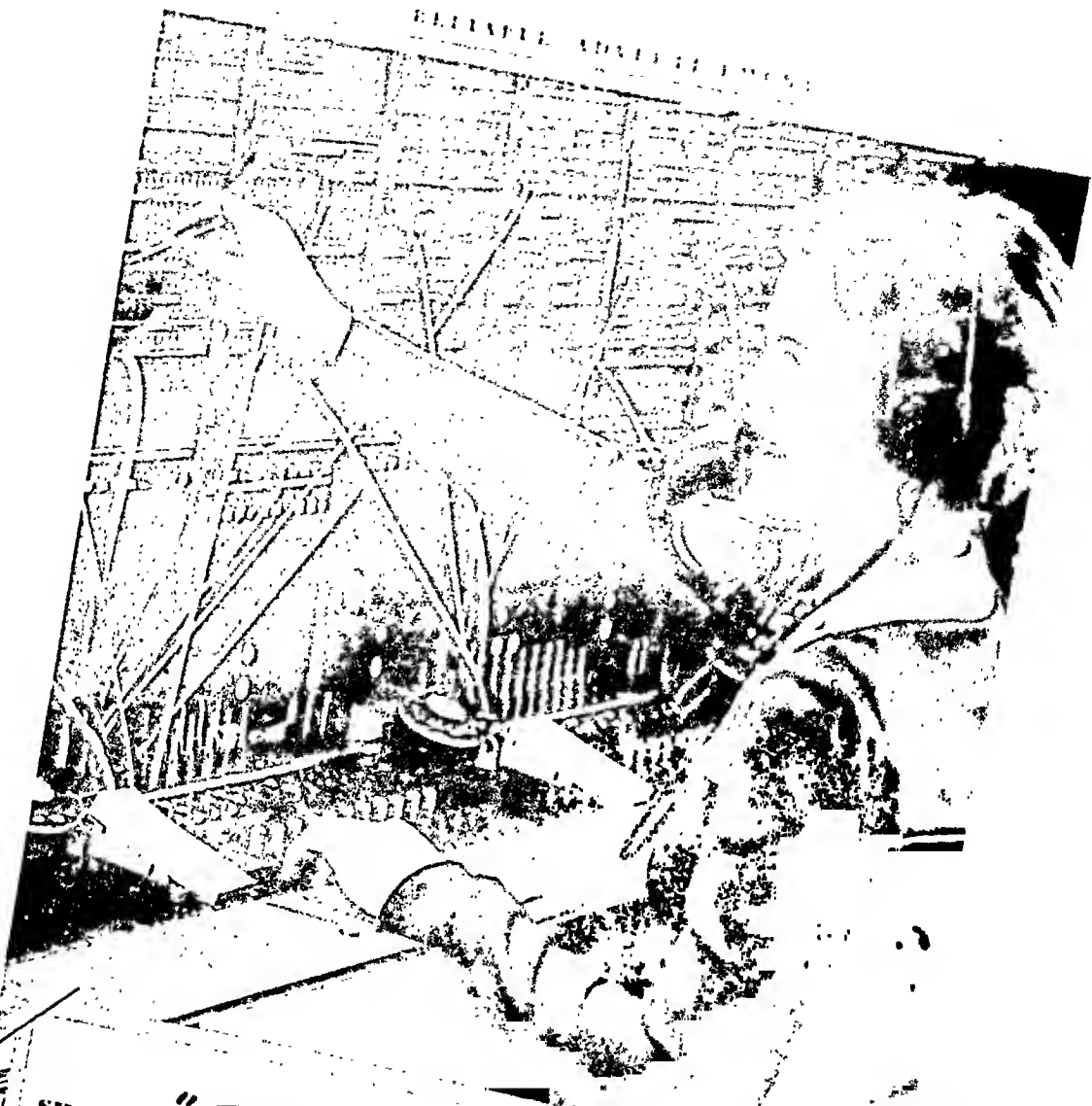


<i>Contents—Continued</i>	PAGE
A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass.	293
<i>W. G. Smillie, M.D., G. H. Warnock, M.D., and Harold J. White</i>	
The Health Department in the Field of Medicine	303
<i>R. H. Riley, M.D., Dr.P.H.</i>	
The Dark Adaptation Test for Vitamin A Deficiency	309
<i>Carroll E. Palmer, M.D.</i>	
Present Status of Phosphatase Test for Pasteurization	316
<i>Walter von Dohlen Tiedeman, M.C.E.</i>	
Discussion:	
<i>Paul F. Krueger</i>	320
<i>Sol Pincus, C.E.</i>	322
Nutritional Influence on Teeth	325
<i>Frances Krasnow, Ph.D.</i>	
Practical Procedures in School Health Service	334
<i>Dorothy B. Nyswander, Ph.D.</i>	
Education of the Handicapped Child	340
<i>Bronson Crothers, M.D.</i>	
Measurement of Sanitary Ventilation	343
<i>William Firth Wells and Mildred Weeks Wells</i>	
Basic Principles of Healthful Housing	351
Preliminary Report of the Committee on Hygiene of Housing	
<i>Prof. C.-E. A. Winslow, Chairman</i>	
EDITORIALS:	
“Strength Is Incapable of Effort, Wealth Useless and Eloquence Powerless If Health Be Wanting”	373
Sanitation in the Next War	374
Serodiagnosis of Syphilis	375
Chemoprophylaxis in Poliomyelitis	376
The Use of Antityphoid Vaccine During Epidemics	378
Protection Against Poison Gas	379
Letter to the Editor— <i>Arthur T. McCormack, M.D.</i>	380

Continued on page viii

Reprint prices furnished upon request

RELIABLE ADVERTISING



SHE SAYS

"Please" AND "Thank You"

THE alert, courteous voice of the telephone operator is known to all who use the telephone.

To the little old lady in the shawl, the man in the big house on the hill, or a tiny tot of six, the words are the same, "Number, please" and "Thank you."

The Bell System appreciates your patronage and tries to deserve it. In everything that concerns telephone service, we hope you can say: "They're nice people to do business with."

BELL TELEPHONE SYSTEM

When writing to Advertisers, say you saw it in the JOURNAL



Contents—Continued

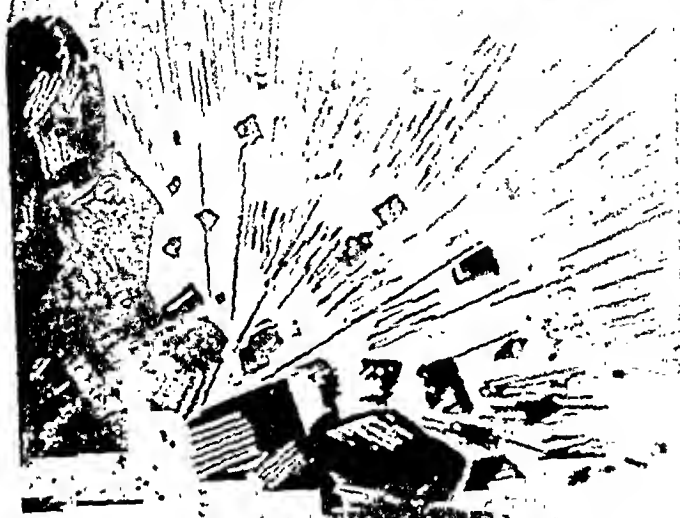
	PAGE
Public Health Education— <i>Evart G. Routzahn</i>	382
For Kansas City in October. What Is Visual Education and How? Talk Warily and Wisely. Don't Waste a Newspaper Man's Time. Topics-of-the-Month in Indiana. "How to Win Prospects—And Influence New York's Health." Health Education in the Journal. In Hygeia for Feb., 1938. Commercial Gadgets. For Education and Reference. Safety. Staff Training. Magazine Articles. Motion Pictures. New. Dates Ahead. Reporting. In Bulletins and Journals.	
Books and Reports	396
Annual Report of the Surgeon General, Public Health Service of the United States, Fiscal Year Ended June 30, 1937. Experimenti Di Vaccinazione Anti-tuberculare (Milan). The Cost of Adequate Medical Care. A Pediatrician in Search of Mental Hygiene. The Family in Health and in Illness. Health Education of the Public: A Practical Manual of Technic. Your Diet and Your Health. New Light on Delinquency and Its Treatment. A Handbook of Accepted Remedies (2nd ed.). Maternal Deaths: The Ways to Prevention. Diseases of the Nervous System in Infancy, Childhood and Adolescence. Board Members' Manual (N.O.P.H.N.) (2nd ed.) Nutrition: Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy. Bacteriology: A Text-Book of Microorganisms (3rd ed. rev.).	
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . .	405
Books Received	408
Association News	409
Sixty-seventh Annual Meeting—Officers and Executive Committee. Kansas City. Applicants for Membership. Deceased Members.	
Employment Service	413
News from the Field	414
Conferences and Dates	420

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.	X	Eimer & Amend.	XXIII
Book Service	XIV, XXII	Federation of Sewage Works Associations. .	XIX
Gifts and Bequests.	XX	Foot Hygiene Publishers.	XIX
Membership Application Form.	XII	Gilliland Laboratories, Inc.. The.	II
Affiliated Societies and Branches.	XII	International Equipment Co.	XXI
American Can Company.	XXV	Kimble Glass Company.	VII
American Telephone & Telegraph Co.	v	Lederle Laboratories, Inc.	III
Bell Telephone System.	v	Leitz, E., Inc.	XVI
Canadian Public Health Journal.	XXIII	National Drug Company, The.	XI
Cocomalt	XVII	National Organization for Public Health	
Corning Glass Works.	XIII	Nursing	XXI
Davis, R. B., Co.	XVII	Public Health Nursing.	XXI
Difco Laboratories, Inc.	Back cover	Pyrex Laboratory Glassware.	XIII
Directory of Health Service.	XXIV	Sewage Works Journal.	XIX
American Water Works Association		Squibb, E. R., & Sons.	IX
Bendiner & Schlesinger Laboratories		Trained Nurse, The.	XXII
Black and Veatch		United Fruit Company.	XV
Committee on Administrative Practice,		Wallace & Tiernan Co., Inc.	XXVIII
A.P.H.A.			
Information Service, A.P.H.A.			

MOVING MOUNTAINS

THROUGH CHEMISTRY



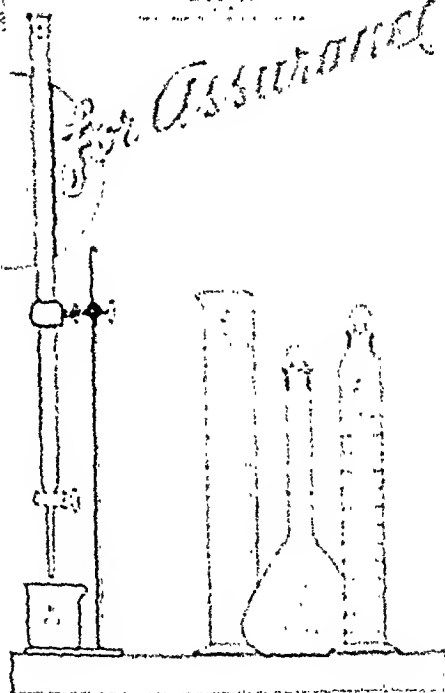
RETESTED
K
KIMBLE
BLUE
LINE

Best Assurance

Through the power of explosives, impassable mountain ranges bow to the engineer's command—railroads, bridges and dams follow in the wake of these man-made earthquakes. Construction rides on apace each year as over 300,000,000 pounds of dynamite, nitroglycerine, blasting powder and other permissible explosives carve the way. In 1935 over \$40,667,000 worth of these products were consumed by the quarry, mining and construction industries.

The exacting quality control of this violent but useful power depends greatly on Kimble Blue Line Exax. In the great industrial and research centers—in chemical plants, clinical and medical institutions—Blue Line Exax has placed control, test and analysis on a higher plane of accuracy and ASSURANCE. The easy-to-read, brilliant BLUE fused-in calibrations, and the highly annealed (strain-free) construction of established standard of industry and science—for safety and service.

Stocked by leading Laboratory Supply Houses throughout the U.S. and Canada



• • • The Visible Guarantee of Invisible Quality • • •

KIMBLE GLASS COMPANY . . . VINELAND, N. J.
NEW YORK • CHICAGO • PHILADELPHIA • DETROIT • BOSTON

When writing to Advertisers, say you saw it in the JOURNAL

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

April, 1938

Number 4

CONTENTS

	PAGE
Certain Criteria in the Qualifications and Preparation of Health Officers <i>Henry E. Meleney, M.D.</i>	423
The Physician's Statement of Cause of Death <i>A. Hardisty Sellers, M.D., D.P.H.</i>	430
Organisms Involved in the Pollution of Water from Long Stored Feces <i>Leland W. Parr, Ph.D.</i>	445
Preventive Aspects of Crippling Diseases <i>H. E. Hilleboe, M.D.</i>	451
The Public Health Nurse and Orthopedic Nursing Care <i>Dorothy J. Carter, R.N.</i>	458
Social Work and the Physically Handicapped Child in the Development of a New State Program <i>Dorothy Buckner</i>	464

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazýck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

For early treatment and prophylaxis of

WHOOPING COUGH

WHOOPING COUGH is not an innocuous disease; its death rate during the first three months of 1937 was greater than those from diphtheria, measles and poliomyelitis combined. (U. S. Public Health Reports)

When it is considered, moreover, that by far the largest proportion of these deaths is concentrated in the lowest age group (under 3 years), the problem of whooping cough becomes the acute concern of child health authorities.

Clinical experience with the new "Pertussis Antigen (Detoxified) *Lederle*" in the treatment of early cases, or in the prophylactic treatment of exposed children, gives hope that in this immunizing antigen we have an unusually effective agent for use under epidemic conditions.

Used early in treatment, the disease has been modified and its course shortened.

Used for the prevention of whooping cough among exposed children, only a very small percentage have developed symptoms, and these were mild in character.

This new antigen is non-toxic, free of bacterial cells and contains a minimum of autolytic products.

PERTUSSIS ANTIGEN *Lederle*

Packages:—3 vials—2 cc. each
1 vial—20 cc.

Lederle

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA, N. Y.



<i>Contents—Continued</i>	PAGE
Acquired Tuberculosis in the Primate in Laboratories and Zoölogical Collections	469
<i>C. R. Schroeder, D.V.M.</i>	
Industrial Hygiene Applied to the Clothing Manufacturing Industry . . .	476
<i>Wilmer H. Schulze, Phar.D.</i>	
Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia .	479
<i>Samuel R. Haythorn, M.D., and Harry B. Meller</i>	
Physique and Health	487
<i>Jesse Feiring Williams, M.D.</i>	
Problem of the Causes of Stillbirth	491
<i>Ethel C. Dunham, M.D., Elizabeth C. Tandy, D.Sc., Edwin F. Daily, M.D., and Clara E. Hayes, M.D.</i>	
Extent and Seasonal Variations of Intermittency in Growth	499
<i>C. E. Turner, Dr.P.H., Sc.D., and Alfred Nordstrom</i>	

EDITORIALS:

The Need for a National Health Program—Report of the Technical Committee on Medical Care	506
"It Can't Be Done Under Our Law"	508
The So-called Humane Pound Law in California	510
"Nineteen Thirty-seven a Star Health Year"	510
Public Health Education— <i>Evert G. Routzahn</i>	512
An Award for You: An Idea for Others. The Office of Public Health Education. How Many Public Health Educators Are There? Health Education DeLuxe. Health Education in Journal, February, 1938. Radio Censors Cancer Education. "The Health Officer," December, 1937. "The Health Officer," January, 1938. Hygeia for March, 1938. Wanted. Bulletins or Organs. Dates Ahead. Magazine Articles. Radio. Schools and Children. Reporting. For Education or Reference. Recognition and Instruction. Planning Public Education. Puppets—Marionettes.	

Continued on page viii

Reprint prices furnished upon request

HEALTH OFFICIALS ENDORSE G-E ELECTRIC SINK WITH DISHWASHER AND DISPOSAL



MUNICIPAL health officials praise the G-E Sink as a modern, sanitary convenience which eliminates two of the most unpleasant kitchen tasks.

The General Electric Sink combines Dishwasher and Disposall. With the G-E Dishwasher, dishes, silverware, pots and pans are washed hygienically in water at pasteurization temperatures . . . far hotter than human hands can stand. Dishes dry in their own heat. No more unsanitary dishcloths and towels! With the G-E Disposall, all food wastes—even chop bones—are shredded to a thin pulp and washed away down the drain like water. No more messy accumulation of garbage! No more trips outdoors in all kinds of weather to the unsightly, germ-breeding garbage can! Let us send you descriptive literature. Write today. General Electric Company, Specialty Appliance Div., Sec. AJ4, Nela Park, Cleveland, O.

GENERAL ELECTRIC

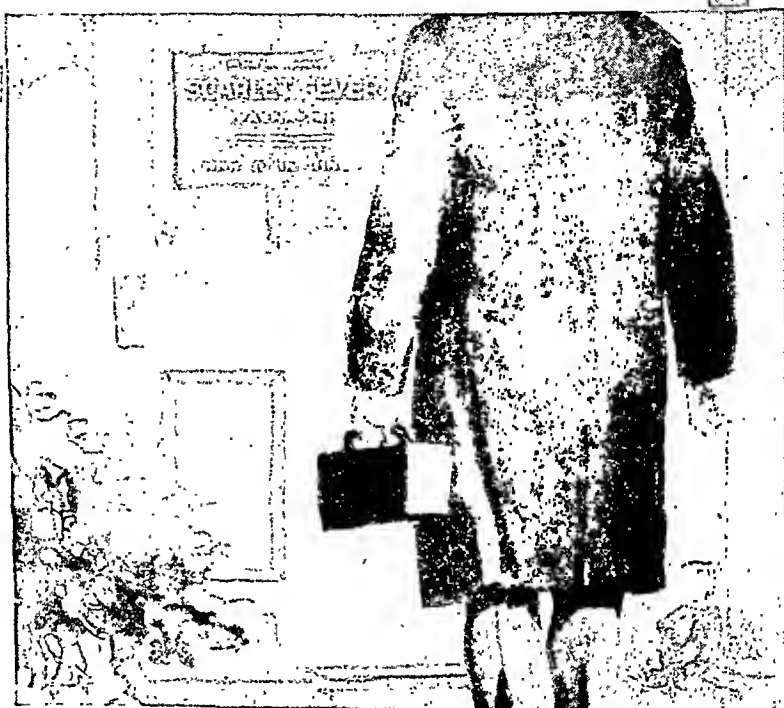
Contents—Continued

	PAGE
Books and Reports	524
Books of Special Interest to Public Health Workers— <i>Maszyck P. Ravenel, M.D.</i>	
Preview of Books for Public Health Workers.	
National Health Survey: Preliminary Reports. Getting Ready To Be a Mother (3rd ed.). Les Microbes Anaérobies. Twenty-five Years in Health Progress. The Psychology of Eating. The Management of the Pneumonias. Practical Bacteriology, Haematology and Animal Parasitology. Dr. Nash's Cookery Book.	
Books Received	539
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . .	540
Association News	543
Applicants for Membership. Deceased Members. Conference on the Hemolytic Streptococci. Royal Sanitary Institute. Publications Needed. Correction.	
Employment Service	547
News from the Field	548
Conferences and Dates	555

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.....	X	Lea & Febiger, Publishers.....	XXI
Book Service.....XVII, XXX, XXXII,	XXXVII	Lederle Laboratories, Inc.....	III
Gifts and Bequests.....	XXXVI	Leitz, E., Inc.....	XI
Membership	XII	Macmillan Company, The.....	XXII
Affiliated Societies and A.P.H.A. Branches	XI	McGraw-Hill Book Co., Inc.....	XXVII
American Can Company.....	XXXIX	Morris, Philip, & Co., Ltd., Inc.....	XIII
American Social Hygiene Association....	XXIX	National Drug Company, The.....	IX
Barnes, A. S., and Company.....	XVIII	National Organization for Public Health Nursing	XXXV
Barnes & Noble, Inc.....	XIX	Open Road, The.....	557
Blakiston's, P., Son & Co., Inc.....	XX	Public Health Nursing.....	XXXV
Canadian Public Health Association....	558	Pyrex Laboratory Glassware.....	XV
Corning Glass Works.....	XV	Reinbold Publishing Corporation.....	XXIII
Difco Laboratories, Inc.....	Back cover	Ronald Press Company, The.....	XXV
Directory of Health Service.....	XXXVIII	Rural Press, The.....	XXXI
American Water Works Association		Sewage Works Journal.....	XIII
Bendiner & Schlesinger Laboratories		Southern Branch, A.P.H.A.—Transactions	XXXVII
Black & Veatch		Spencer Lens Cnmpany.....	XVI
Book Service, A.P.H.A.		Squibb, E. R., & Sns.....	VII
Committee on Administrative Practice, A.P.H.A.		Thomas, Charles C., Publisher.....	XXIV
Diversey Corporation, The.....	XXXV	Trained Nurse, The.....	XVI
Dorrance & Company, Inc.....	XXXI	United Fruit Company.....	XXXIII
Everson Mfg. Cn.....	XXXV	University of Chicago Press, The.....	XXVI
Federation of Sewage Wnrks Associations	XIII	Vitex Laboratories, Inc.....	XIV
General Electric	V	Wallace & Tiernan Co., Inc.....	XXXIV
Gilliland Laboratnries, Inc., The.....	II	Whittlesey House Publications.....	XXVII
Kellogg's All-Bran	XXXV	Wood, William, & Company (Division of The Williams & Wilkins Company)....	XXVIII

Control **SCARLET FEVER**



MUCH REAL PROGRESS has been made in recent years toward the control of scarlet fever, but despite this fact there are still more than 200,000 cases reported annually in the United States.

There is, therefore, urgent necessity for bending every effort toward abolition of scarlet fever; an end which is readily attainable through proper use of available preventive and curative measures.

The dependable potency and clinical effectiveness of Squibb Scarlet Fever Products make them preparations of choice in a number of institutions and with department of health authorities. They serve equally well the physician in general practice.

For literature address Professional Service Dept., 745 Fifth Ave.

E. R. SQUIBB & SONS, NEW YORK
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

May, 1938

Number 5

CONTENTS

	PAGE
Qualifications of a Venereal Disease Control Officer	559
<i>Thomas B. Turner, M.D.</i>	
Preparing the Nurse to Meet Community Needs in Public Health	566
<i>Marion G. Howell, R.N., M.Sc.</i>	
Suitable Paper Wrappers and Containers for Foods	571
<i>J. R. Sanborn</i>	
Disintegration of Paper Board for Bacteriological Examination	576
<i>J. R. Sanborn</i>	
Control of Nuisances	579
<i>Edward Wright</i>	
Microbial Flora of Paper Containers	587
<i>Fred W. Tanner</i>	
Diagnosis of Industrial Skin Diseases	593
<i>Louis Schwartz, M.D.</i>	

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Warm Days and the

RABIES MENACE

IN THE SPRING OF 1937, the state of Illinois experienced a sharp increase in the incidence of dog-bites as compared with 1936, which, too, had been an alarming year. At the same time there was an increase of over 50% in the number of dogs found positive for rabies.

Despite this increase in rabies among animals the human mortality rate has been maintained at a low figure by the prompt administration of anti-rabies vaccine to those exposed.

Since 1922, the state of Alabama records 9,800 Pasteur treatments with a 0.11% mortality, and 25,064 Semple treatments with a 0.04% mortality.

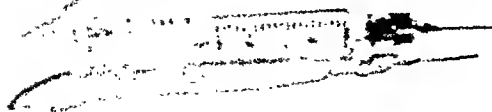
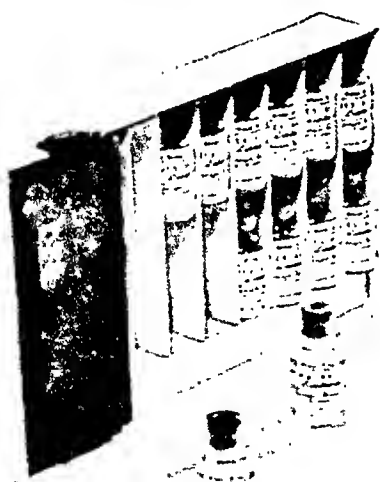
In the face of this proven effectiveness of anti-rabies vaccine, it seems criminal to postpone the initiation of treatment pending the finding of a positive pathology in the animal. The safe way is to start treatment immediately after exposure and to halt the injections if the animal is found to be negative.

RABIES VACCINE (SEMPLÉ METHOD)

Lederle

is available in the 14-dose vial set with syringe and two needles. A supplementary 7-dose set, for use in cases where the bite is severe or where treatment has been delayed, is also obtainable.

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA
NEW YORK, N. Y.



<i>Contents—Continued</i>	PAGE
Interrelationship of Health and Welfare Records and Statistics <i>Ewan Clague, Ph.D.</i>	599
Lung Findings in Foundry Workers—A Four Year Survey <i>O. A. Sander, M.D.</i>	601
Development of an Industrial Hygiene Program in a State Health Department <i>H. F. Eason, M.D., and M. F. Trice</i>	610
Revised Fuchsin Lactose Broth for the Confirmatory Test in Water Analysis <i>Cassandra Ritter</i>	616
Abortion and the Public Health <i>Régine K. Stix, M.D., and Dorothy G. Wichl</i>	621
Improved Laboratory Control of Pasteurized Milk <i>Walter von Dohlen Tiedeman, M.C.E., and Nelson J. Hohl, M.S.</i>	629
Supervision of Fumigation and Extermination <i>John Oberwager, M.D.</i>	633
Heart Disease in Childhood <i>T. Duckett Jones, M.D.</i>	637
EDITORIALS:	
The Croydon Epidemic of Typhoid Fever	644
Human Tuberculosis of Bovine Origin	646
Safe Milk for England?	647
The King of England Recognizes Preventive Medicine	649
Letter to the Editor— <i>J. W. McIntosh, B.A., M.B., D.P.H.</i>	650
Public Health Education— <i>Evert G. Rontzahn</i>	652
A Great Year for Health Education. "Danger Ahead"—Steep Hills and Sharp Curves. "When Ladies Meet." To Reward or Not to Reward. If an Accident Occurs. How It Is Said. The Hospital (The Clinic) Needs a Bulletin. A University Anti-Syphilis Campaign. So "Popular" Science Literature. Commercial Gadgets. Magazine Articles. "Health"—New Haven Department of Health Bulletin.	

Continued on page viii

Reprint prices furnished upon request

THE BIGGEST TELEPHONE VALUE FOR YOUR MONEY



Nowhere in the world do people get so much for their telephone money as in America. No other people get so much service and such good service at such low cost.

BELL TELEPHONE SYSTEM



When writing to Advertisers, say you saw it in the JOURNAL

Contents—Continued	PAGE
Books and Reports	658
The Conquest of Cholera, America's Greatest Scourge. Legal Medicine and Toxicology. Apes, Men, and Morons. Bacteriological Atlas (2nd ed.). Good House-keeping and Safety in Foundries. Poisons, Potions and Profits: The Antidote to Radio Advertising. Biological Laboratory Technique: An Introduction to Research in Embryology, Cytology and Histology. Reading, Writing and Speech Problems in Children. A Workbook in Health for High School Girls. The Principles and Practice of Clinical Psychiatry. Public Health and Hygiene, A Students' Manual (2nd ed.). Principles of Medical Statistics. The Biology of Pneumococcus. Milestones in Medicine. Toxicology. Not so Long Ago: A Chronicle of Medicine and Doctors in Colonial Philadelphia.	
Books Received	666
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . .	667
Kansas City Invites You	670
Headquarters for the Sixty-seventh Annual Meeting. Hotel Reservation Form. Map of City.	
Association News	677
Applicants for Membership. Skin Irritants Report Available. Publications Needed.	
Employment Service	681
News from the Field	682
Summer School Courses in Public Health	
Conferences and Dates	691

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.	X	Directory of Health Service	XXI
Book Service	XIV, XIX, 694	Information Service, A.P.H.A.	
Gifts and Bequests	XXII	Eimer & Amend	XVI
Membership Application Form	XII	Everson Mfg. Co.	XIX
Affiliated Societies and Branches	XII	Federation of Sewage Works Associations	XVI
American Can Company	XXIII	Gilliland Laboratories, Inc., The	II
American Telephone & Telegraph Co.	V	International Equipment Co.	XVII
Bell Telephone System	V	Kimble Glass Company	VII
Canadian Public Health Journal	694	Lederle Laboratories, Inc.	III
Cancer—American Society for the Control of Cancer	XX	Leitz, E., Inc.	XVII
Cocomalt	XV	National Drug Company, The	XI
Davis, R. B., Co.	XV	National Organization for Public Health Nursing	XXI
Difco Laboratories, Inc.	Back Cover	New York City Cancer Committee	XX
Directory of Health Service	XXI	Public Health Nursing	XXI
Bendiner & Schlesinger Laboratories		Sewage Works Journal	XVI
Black and Veatch		Squibb, E. R., & Sons	IX
Committee on Administrative Practice, A.P.H.A.		Trained Nurse, The	XIX
		Vitex Laboratories, Inc.	XIII
		Wallace & Tiernan Co., Inc.	XVIII
		Womans Press, The	XIX

\$2,600,000,000 IN TEXTILES



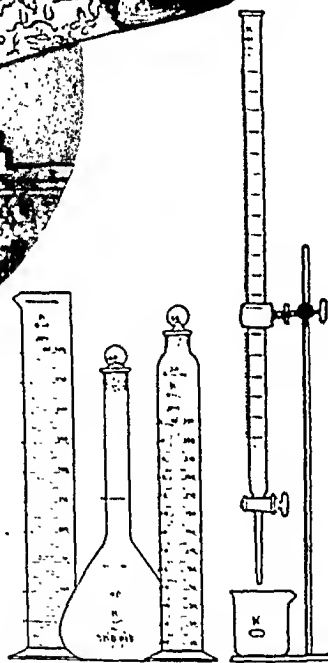
Greatest American industrial group in number of wage earners employed—in number of large plants and of electric motors installed, and second in rank in value of its products—is the textile industry. From almost 6000 textile mills in the U. S. come knit goods, woolens, silks, rayons, linens, felts, cottons, etc., valued annually at over \$2,600,000,000. To operate this vast industrial group requires \$30,000,000 worth of belting, 4,000,000 horsepower, and \$79,000,000 worth of textile machinery!

Safeguarding this mammoth investment are the modern textile chemical laboratories which control production, perfect new processes, and produce newer and more useful products. And into these great plants goes an ever-increasing quantity of Kimble Blue Line Exax Glassware—for research and control, for protection to quality and profits.

Similarly, in every phase of the chemical and process industries—in every great clinical and medical center—you will find Kimble Blue Line Exax Glassware carrying on its endless task of scientific protection to investments, to results, and to life itself.

When you buy Laboratory Glassware, buy for safety and ASSURANCE. Specify Kimble BLUE LINE EXAX!

Stocked by leading Laboratory Supply Houses throughout the U. S. and Canada



The Visible Guarantee of Invisible Quality

KIMBLE GLASS COMPANY VINELAND, N. J.
 NEW YORK • CHICAGO • PHILADELPHIA • DETROIT • BOSTON

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28 June, 1938 Number 6

CONTENTS

	PAGE
Problems of a Housing Enforcement Program <i>L. M. Graves, M.D., and Alfred H. Fletcher</i>	695
The Epidemiology of Trichinosis <i>C. D. Barrett, M.D., and Richard Sears, M.D.</i>	706
Nutrition Program in a State Health Department <i>Woodbridge E. Morris, M.D.</i>	718
A Tabular Outline for Use in Reporting Hospital Morbidity <i>Joseph Berkson, M.D.</i>	723
The Acute Diarrheal Disorders <i>A. V. Hardy, M.D., Dr.P.H., and James Watt, M.D.</i>	730
A Water-Borne Outbreak of Gastroenteritis in a Tennessee Town <i>Crit Pharris, M.D., F. W. Kittrell, and W. C. Williams, M.D.</i>	736

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

In severely contused wounds and puncture wounds —

TETANUS ANTITOXIN

[GLOBULIN **Lederle** MODIFIED]

SEVERELY CONTUSED WOUNDS and puncture wounds with penetration of foreign material are of the type most likely to be followed by tetanus.

Prophylactic tetanus antitoxin should be administered as early as possible after—

FIRECRACKER WOUNDS
BLANK CARTRIDGE WOUNDS
GUNSHOT WOUNDS

PUNCTURE WOUNDS
MACHINERY WOUNDS
COMPOUND FRACTURES

CRUSHED WOUNDS



"The teaching that tetanus will not develop in a drained wound is fallacious. The practise of not giving prophylactic doses of antitoxin in cases of puncture wounds is dangerous."*

In recent years the practise of giving 3,000 units of Tetanus Antitoxin instead of 1,500 units, the dose formerly recommended, has become more common.

"Tetanus Antitoxin (Globulin-Modified) Lederle" is so markedly concentrated and purified that the 3,000-unit dose is contained in a volume of 1 cc. With the "Globulin-Modified" antitoxin the incidence of reactions remains negligible despite the increase in potency.

*Bunch, Geo. H., Southern Medicine & Surgery; July, 1937.

In the treatment of tetanus, it is indicated that whatever benefit may be derived from antitoxin is probably due to that antitoxin which is administered early. Clinical reports suggest that large doses (100,000 to 200,000, or even more) be given immediately upon diagnosis.

Packages:

"TETANUS ANTITOXIN (GLOBULIN-MODIFIED) Lederle"

For Prophylaxis

1,500 units in syringe
3,000 units in syringe
1,500 units in vial

For Treatment

10,000 units in syringe
20,000 units (intraspinal outfit)
20,000 units in syringe
40,000 units in syringe

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA NEW YORK, N.Y.

For prevention and treatment

Gastroenteritis Disorder Not Proved To Be Water-Borne	741
<i>D. G. Gill, M.B., D.P.H., and James G. McAlpine, Ph.D.</i>	
Discussion— <i>C. D. Bowdoin, M.D.</i>	

Pathological and Immunological Studies in Poliomyelitis and Their Significance in Therapy and Treatment	746
<i>Maurice Brodie, M.D.</i>	

Rural Syphilis—A Localized Outbreak	756
<i>R. C. Kimbrough, M.D., D. M. Cowgill, M.D., and E. P. Bowerman, M.D.</i>	

Lactobacillus Acidophilus and Dental Caries	759
<i>Philip Jay, D.D.S.</i>	

Survival of <i>E. Typhi</i> in Sewage Treatment Plant Processes	762
<i>Carl E. Green and Paul J. Beard, Ph.D.</i>	

EDITORIALS:

An American Museum of Health (New York World's Fair)	771
Wade Hampton Frost	773
George Miller Sternberg	774
Some Public Health Aspects of Housing	776
Newer Knowledge of Poliomyelitis	776

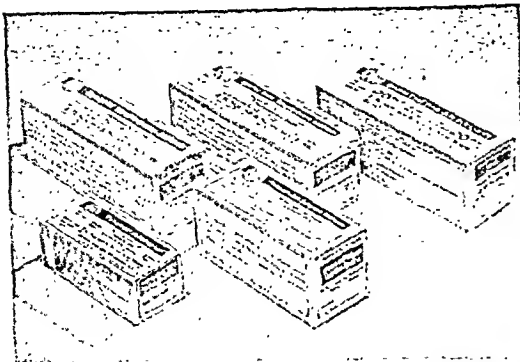
Public Health Education— <i>Evart G. Routzahn</i>	777
---	-----

They Aim to Please in Delaware. Social Hygiene Racketeering. The Health Department Library. County Nurse Hits the Bull's Eye. Do You Know What to Believe? Basic to Success Against Cancer. A Comprehensive State Health Education Program. When You Come to New York. What *Life* Did. Safety.

Continued on page viii

Reprint prices furnished upon request

RELIABLE ADVERTISEMENTS



SQUIBB ANTITOXINS

Always Dependable

EXTENSIVE RESEARCH in the Squibb Laboratories has resulted in important improvements in the processes used to concentrate and refine antitoxic globulins. As a result, Squibb Antitoxins are distinguished by a high degree of purity, clarity, and freedom from reaction-producing proteins.

Squibb Antitoxins are isotonic with the blood and rapidly absorbed with very little pain or danger of serum reactions.

SQUIBB ANTITOXINS

Scarlet Fever Antitoxin
Tetanus Gas Gangrene Antitoxin
Diphtheria Antitoxin

Erysipelas Antitoxin
Tetanus Antitoxin
Gas Gangrene Antitoxin

E·R·SQUIBB & SONS, NEW YORK
MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

When writing to Advertisers, say you saw it in the JOURNAL

Contents—Continued PAGE

Books and Reports 782

Approved Laboratory Technic (2nd ed.). Experimental Studies of Water Purification. Report of Investigations of the Typhoid Fever Epidemic, Minneapolis, 1935. Report on Eighth International Congress of Military Medicine and Pharmacy. How To Be a Convincing Talker. Latent Syphilis and the Autonomic Nervous System (2nd ed.). Integration, Its Meaning and Application. How To Use Pictorial Statistics. Report on the British Health Services—By Health Group of PEP. Third Symposium on Silicosis (Saranac Lake). The Rat and Ratproof Construction of Buildings. Principles and Practice of Bacteriology. Handbook of Chemistry (2nd ed.).

A Selected Public Health Bibliography—*Raymond S. Patterson, Ph.D.* . . . 793

Books Received 795

Association News 796

Health Conservation Contests. Applicants for Membership. Closing Date for Submitting Applications for Fellowship.

Employment Service 799

News from the Field 800

Conferences and Dates 804

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.	X	Directory of Health Service.....	XVII
Book Service	XIII, XIV, 806	Committee on Administrative Practice, A.P.H.A.	
Gifts and Bequests.....	XVIII	Everson Mfg. Co.....	XIII
Membership	XII	Federation of Sewage Works Associations	XV
Affiliated Societies and A.P.H.A. Branches	XII	Gilliland Laboratories, Inc.. The.....	II
American Can Company.....	XIX	Kellogg's All-Bran.....	VII
Canadian Public Health Association.....	XVII	Lakeside Publishing Company.....	XV
Cocomalt	IX	Lederle Laboratories, Inc.....	III
Davis, R. B., Co.....	IX	Morris, Philip, & Co., Ltd., Inc.....	VII
Difco Laboratories, Inc.....	Back Cover	National Drug Company, The.....	XI
Directory of Health Service.....	XVII	Sewage Works Journal.....	XV
Bendiner & Schlesinger Laboratories		Spencer Lens Company.....	XIII
Black & Veatch		Squibb, E. R., & Sons.....	V
Book Service, A.P.H.A.		Trained Nurse, The.....	XV
		Wallace & Tiernan Co., Inc.....	XVI

VITAMIN B₁ FOR IMPROVED INTESTINAL TONE

Because recent studies have shown that vitamin B₁ has a beneficial effect on the tone of the intestines, this vitamin is receiving more and more attention as an aid in treating atonic constipation.

A good source of vitamin B₁ is Kellogg's All-Bran. Notice below how the vitamin B₁ content of All-Bran compares with that of other foods.

The presence of this vitamin, in such plentiful quantities, in a food which also contains natural "bulk," is being recognized as a further reason for recommending this laxative cereal.

IT TAKES

2 OZ.
OF SPINACH,
OR



2 ¹³/₁₆ OZ.
OF WHOLE EGG
OR



2 ¹/₈ OZ.
OF WHOLE ORANGE,



TO SUPPLY THE
AMOUNT OF B₁
CONTAINED IN 1 OZ.
OF

**Kellogg's
ALL-BRAN**

A Natural Laxative Cereal



The SWING to PHILIP MORRIS

THE rapid increase in Philip Morris sales is unquestioned evidence of America's growing appreciation of a superior product.

Of no little consequence in making Philip Morris a superior cigarette is the decrease in irritation due to the use of diethylene glycol as hygroscopic agent.

PHILIP MORRIS & CO.



Tune in to "JOHNNY PRESENTS" on the air Coast-to-Coast Tuesday evenings, NBC . . . Saturday evenings, CBS

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE NEW YORK

Please send me reprints of papers from

- ★Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245 ☐
- Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154 ☐
- N. Y. State Jour. Med. June 1935, Vol. 35, No. 11 ☐
- Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60 ☐

SIGNED _____

ADDRESS _____

CITY _____ **STATE** _____ **PH** _____

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

July, 1938

Number 7

CONTENTS

	PAGE
Investigation of Early Syphilis	807
<i>William T. Clark, M.D., and Cleland A. Sargent, M.D.</i>	
Nutrition Services in Maternal and Child Health Programs Under the Social Security Act.	813
<i>Marjorie M. Heseltine</i>	
Accuracy of the Cancer Death Records	818
<i>Eleanor J. MacDonald</i>	
Precision Methods in the Determination of the Heavy Metals	825
<i>Lawrence T. Fairhall, Ph.D.</i>	
Formate Ricinoleate and Brilliant Green Bile Broths to Detect Coliform Organisms in Pasteurized Milk	832
<i>I. C. Gunsalus and C. N. Stark</i>	

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Banishing Diphtheria with

REFINED DIPHTHERIA TOXOID
(ALUM PRECIPITATED)*Lederle*

STATISTICS AMPLY SUPPORT the value of diphtheria immunization. The need for a universal immunizing program is emphasized by the observation⁽¹⁾ that:—

"... wherever preventive inoculation against diphtheria is practised consistently, diphtheria deaths well-nigh cease to occur, and in some communities diphtheria morbidity is also reduced to an insignificant figure".

The effectiveness of Alum-Precipitated Toxoid as an immunizing agent is demonstrated by the figures presented by Saunders (*Lancet*, 1937, 1, 1065), following a study of 2,157 children, treated with a single 1 cc. injection of Alum-Precipitated Diphtheria Toxoid.

Interval after injection	Cases Tested	Schick Negative (%)
5 weeks	867	94.4
6 weeks	446	99.3
7-9 weeks	304	99.0
10-12 weeks	182	100.0
Over 12 weeks	358	99.4

Havens' method for single injection immunization is calculated to meet with a greater degree of public cooperation with immunizing programs.

"Refined Diphtheria Toxoid (Alum-Precipitated) *Lederle*" is designed to provoke a rapid lasting immune response, with a minimal incidence of unpleasant reactions.

For those who desire to employ the multiple-dose method of immunization by means of plain toxoid, "Diphtheria Toxoid (Plain) *Lederle*" is also available.

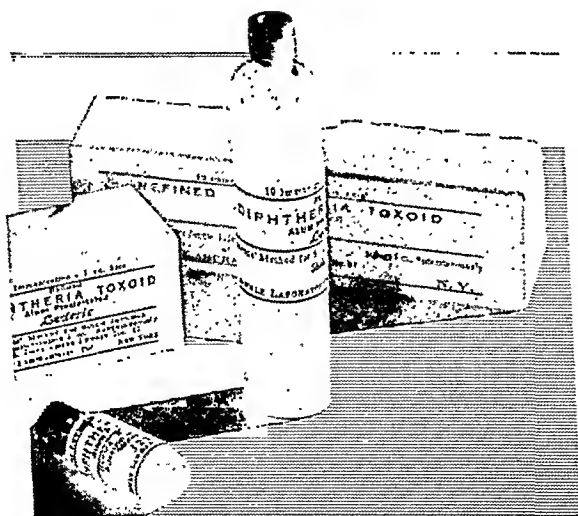
(1) Special Article J. A. M. A. 106:2065, June 13, 1936.

Booklet on request

LEDERLE LABORATORIES
INC.

30 ROCKEFELLER PLAZA

NEW YORK, N. Y.



PACKAGES:—

Refined Diphtheria Toxoid (Alum-Precipitated) *Lederle*
1 dose for immunization
1 immunization (1 cc. or 0.5 cc. vials)
10 immunizations (10 cc. or 5 cc. vials) and
10 1 cc. vials or 0.5 cc. vials

Politics in the Selection of Health Department Personnel: Is There a
Remedy? 835
William Parr Capes ..

A Sanitary Study of Commercial Laundry Practices 839
Lloyd Arnold, M.D.

Supervision of Food in New York City 845
A. Lichterman, Phar.D.

The Nutritionist in a City Public Health Program 849
Sophia S. Halsted

Schick Reactions in Students of Medicine 854
H. C. Pulley and Moyer S. Fleisher

Evaluation of Dental Programs for Children 859
J. M. Wisan, D.D.S.

Public Health Degrees and Certificates Granted in 1937 863
W. S. Leathers, M.D., Chairman

EDITORIALS:

Western Branch, American Public Health Association—Ninth Annual
Meeting 869

Estimates of Nutritional Status 871

The Dead Hand of Authority 872

A Contrast 874

Public Health Education—*Evert G. Routzahn* 876
Education in a Cancer Program. The Income of the Audience. The Uncounted
Radio Audience. To Quote and To Be Quoted. "Where They Can Learn."
Special Editions. Magazine Articles.

Continued on page viii

Reprint prices furnished upon request



"THANKS FOR CALLING"

The telephone helps a lot of folks to know each other better. Business is easier—friends are nearer—life is richer—because of it.

"Thanks for calling," spoken over the telephone many times a day, is a friendly reminder of the usefulness, dependability and value of Bell System service.

BELL TELEPHONE SYSTEM

When writing to Advertisers, say you saw it in the JOURNAL



Contents—Continued

	PAGE
Books and Reports	880
Lectures on the Control of Syphilis and Other Infectious Diseases. Milk Control: Governmental Regulation of the Dairy Industry in the United States. Health Section Report, World Federation of Education Associations. The Foundations of Nutrition (3rd ed.). Standard Business Etiquette. Dairy Bacteriology (2nd ed.). Fit to Teach: A Study of the Health Problems of Teachers. Let's Grow. Let's Stay Well. Health. Cleanliness and Health. Intensive Rural Hygiene Work in Netherlands India. Tuberculosis Among Children and Young Adults (2nd ed.). Pulmonary Tuberculosis in Practice. Fifty Years a Country Doctor. Personnel Policies in Public Health Nursing. Methods of Analysis for the Butter Industry.	
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . .	890
Books Received	893
Association News	894
The Health Conservation Contests. Applicants for Membership. Deceased Members. Closing Date for Submitting Applications for Fellowship.	
Employment Service	898
News from the Field	900
Conferences and Dates	905

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.	X	Directory of Health Service	XXI
Book Service	XIV, XVII, XIX	Employment Service, A.P.H.A.	
Directory of Exhibits, Annual Meeting A.P.H.A.	XVIII, XIX	Everson Mfg. Co.	XV
Gifts and Bequests	XXII	Federation of Sewage Works Association	XX
Membership Application Form	XII	Gilliland Laboratories, Inc., The	II
Affiliated Societies and Branches	XII	International Equipment Co.	XXI
American Can Company	XXIII	Kellogg's All-Bran	XV
American Telephone & Telegraph Co.	V	Kimble Glass Company	VII
Bell Telephone System	V	Lakeside Publishing Company	XX
Canadian Public Health Journal	XVII	Lederle Laboratories, Inc.	III
Difco Laboratories, Inc.	Back Cover	National Drug Company, The	XI
Directory of Health Service	XXI	Sewage Works Journal	XX
Bendiner & Schlesinger Laboratories		Squibb, E. R., & Sons	IX
Black & Veatch		Trained Nurse, The	XX
Committee on Administrative Practice, A.P.H.A.		Vitex Laboratories	XIII
		Wallace & Tiernan Co., Inc.	XVI

KIMBLE BRAND

For Assurance WEIGHING BOTTLES

WITH OUTSIDE GROUND CAPS

(CATALOG No. 15146)

*Featuring 8 Advantages
Every Chemist Wants!*

- ① The cap protects the top of the bottle from breakage when the bottle is tipped over.
- ② Material within the bottle does not come into contact with any ground surface.
- ③ Elimination of penny head top removes one source of breakage.
- ④ Bottle and stopper are so designed that an air tight joint is assured.
- ⑤ Increased head room provided by the stopper decreases danger of fluffy material being sucked out when stopper is removed.
- ⑥ No chance of contamination of contents from dirt, such as occurs with the old style bottle.
- ⑦ Bottles and stoppers have large, plainly visible corresponding serial numbers.
- ⑧ Every bottle has a small sandblasted area suitable for pencil inscriptions.

AVAILABLE SIZES

Inside Diam. (mm)	15	15	25	25	30	40	40
Height of Body (mm)	50	80	40	50	60	50	80

FOR DETAILS on prices and packages, consult any reputable Laboratory Supply Dealer in the United States or Canada.



• • • *The Visible Guarantee of Invisible Quality.* • • •

KIMBLE GLASS COMPANY VINELAND, N. J.
 NEW YORK • CHICAGO • PHILADELPHIA • DETROIT • BOSTON

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

August, 1938

Number 8

CONTENTS

	PAGE
Mercury Poisoning from the Public Health Viewpoint <i>Paul A. Neal, M.D.</i>	907
The Case of Public Health vs. Public Welfare <i>Homer Folks, LL.D.</i>	916
Chloramine Treatment of Sea Water <i>Lewis V. Carpenter, Lloyd R. Setter, and Morris Weinberg</i>	923
The Health Department in the Field of Medicine—From the Standpoint of a Private Practitioner <i>Charles H. Goodrich, M.D.</i>	929
Measles in Detroit, 1935—I, Factors Influencing the Secondary Attack Rate Among Susceptibles at Risk <i>Franklin H. Top, M.D.</i>	935

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

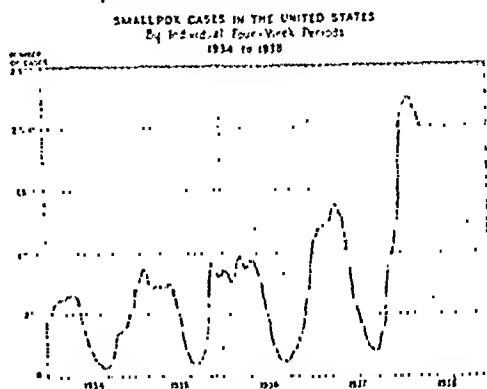
Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Probably the most easily preventable disease is

SMALLPOX

—And yet SMALLPOX has been appearing with a more and more disheartening frequency of late.

Four years ago it seemed that this dangerous disease was at last coming under control and that it was only a question of time when smallpox would be finally eliminated as a major health problem in this country; but, the accompanying chart shows how far from this goal we are to-day.



From the Statistical Bulletin, Metropolitan Life Ins. Co., 19: No. 5 (May) 1938.

By the application of the relatively simple procedure of universal vaccination, and at a nominal cost per person, Smallpox can be completely banished. This has been proven in certain foreign countries where universal vaccination has been strictly enforced, with the result that they have been entirely free from the disease for years.

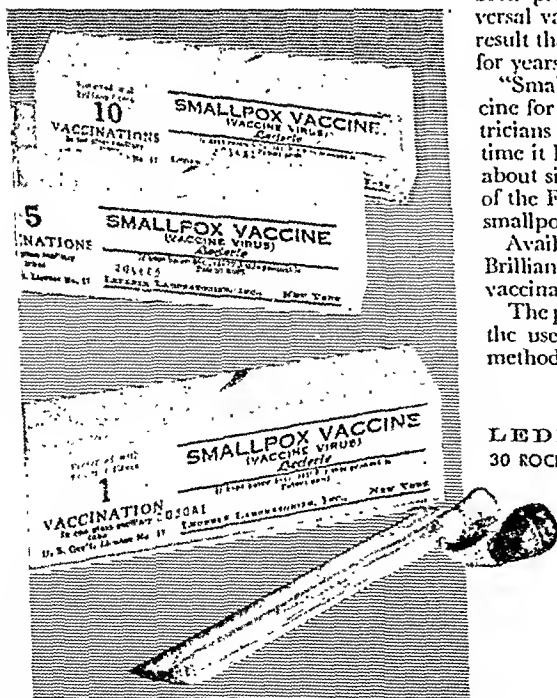
"Smallpox Vaccine Lederle" is a safe, effective vaccine for use in immunization against smallpox. Pediatricians recommend that a child be vaccinated by the time it has reached the age of six months and again at about six years of age (preferably before the beginning of the Fall school term), and whenever an epidemic of smallpox is present.

Available in two forms; U.S.P. and "preserved with Brilliant Green", in capillary tubes for 10, 5 and 1 vaccination each.

The pressure puncture method of vaccination without the use of a shield or dressing is recommended, as a method of choice by the National Institute of Health.

Literature on request

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA
NEW YORK, N. Y.

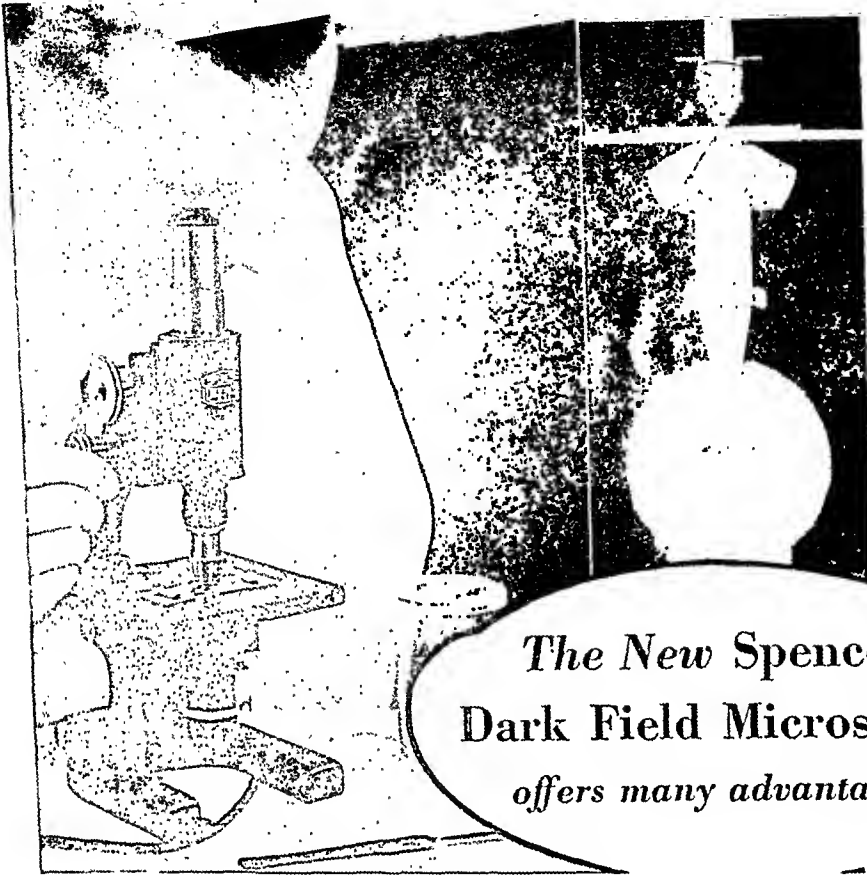


Contents—Continued

	PAGE
Nutritional Education in the Home—Dutchess County, N. Y., Project <i>Bertrand E. Roberts, M.D.</i>	944
Indiana's Dental Health Program <i>Howard B. Mettel, M.D., and Mary H. Westfall, D.D.S.</i>	949
Plumbing in Low Cost Housing <i>Joel I. Connolly</i>	954
Housing and Health <i>Rollo H. Britten</i>	957
EDITORIALS:	
The Auto Trailer	961
What We Owe to the Forefathers	962
Letter to the Editor— <i>Arthur E. Gorman</i>	964
Preliminary Program, 67th Annual Meeting, Kansas City, Mo.	965
Railroad Fares to Kansas City	988
Kansas City Annual Meeting	989
Annual Meeting Information Hotel information and reservation form.	996
Public Health Education— <i>Evart G. Routzahn</i>	998
Consultation at Kansas City. Free Material for Kansas City. Wanted!-- If Announced in Advance! Two Copies for Kansas City. Roll Posters for the Receivers. Are You Interested in Meetings?—In Discussion? Maternity Care Made Graphic. Journal for June, 1938. Why Not Use Colored Paper? Why the Addresses? "We Don't Have Time." When the Scientist Is a Writer. "One Third of a Nation." Wanted.	

Continued on page viii

Reprint prices furnished upon request



The New Spencer
Dark Field Microscope
offers many advantages

Some micro-organisms are so similar in refractive index and color to the medium in which they live that they cannot be seen in the ordinary bright field. Such organisms can be identified easily with the new Spencer dark field microscope because the illumination strikes them from the sides in a dark field, making them self-luminous.

This new Spencer microscope is specially designed as a time saving routine instrument. The substage, with built-in illuminant, is hinged to the stand, thereby holding the dark field condenser and the illuminant in positive alignment with the objective as centered at the factory. The hinged substage facilitates placing oil on and cleaning the condenser.

This instrument is of traditional Spencer quality throughout and is moderately priced.

Write Dept. H19 for new bulletin giving complete description.

Spencer Lens Company

MICROSCOPES
 MICROTOMES
 PHOTOMICROGRAPHIC
 EQUIPMENT



REFRACTOMETERS
 COLORIMETERS
 SPECTROMETERS
 PROJECTORS

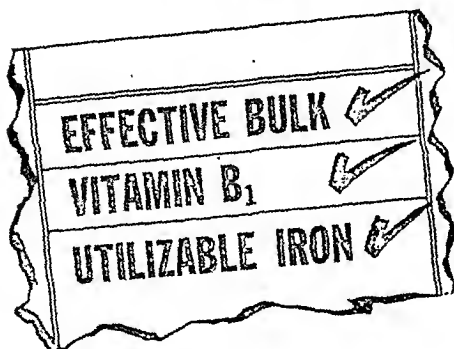
<i>Contents—Continued</i>	PAGE
Books and Reports	1002
Manual for Water Works Operators. A Textbook of Hematology. The Psychology of the Unadjusted School Child (rev. ed.). The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics (2nd ed.). Diet and High Blood Pressure. Safe Living. Let's Help the Doctor. Father's Doing Nicely. The Sanitary Inspector's Handbook: A Manual for Sanitary Inspectors and Other Executive Public Health Officers (3rd ed.). Programs for Local Tuberculosis Associations. Journal of Milk Technology, October, 1937–March, 1938. Clinical Psychology: A Handbook of Children's Behavior Problems. More of My Life. Step by Step in Sex Education. Fluorine Intoxication. The Subnormal Mind (2nd ed.). The Collapse Therapy of Pulmonary Tuberculosis.	
Books Received	1010
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . .	1011
Association News	1014
Nominations for the Governing Council. Applicants for Fellowship. Closing Date for Submitting Applications for Fellowship. Correction. Applicants for Membership. Deceased Members.	
Employment Service	1018
News from the Field	1020
Conferences and Dates	1027

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.....	X	Diversey Corporation, The.....	XV
Book Service	XIII, XVII, XVIII	Everson Mfg. Co.....	XV
Directory of Exhibits, Annual Meeting A.P.H.A.	XVI, XVII	Federation of Sewage Works Associations	XVIII
Gifts and Bequests.....	XX	Gilliland Laboratories, Inc., The.....	II
Membership	XII	Kellogg's All-Bran	VII
Affiliated Societies and A.P.H.A. Branches	XII	Lederle Laboratories, Inc.....	III
American Can Company.....	XXI	Morris, Philip, & Co., Ltd., Inc.....	VII
Canadian Public Health Association.....	XIX	National Drug Company, The.....	XI
Difco Laboratories, Inc.....	Back Cover	Sewage Works Journal.....	XVIII
Directory of Health Service.....	XIX	Spencer Lens Company.....	V
Bendiner & Schlesinger Laboratories		Squibb, E. R., & Sons.....	IX
Black & Veatch		Trained Nurse, The.....	XV
Book Service, A.P.H.A.		Wallace & Tiernan Co., Inc.....	XIV
Committee on Administrative Practice, A.P.H.A.			

Kellogg's ALL-BRAN

SUPPLIES:

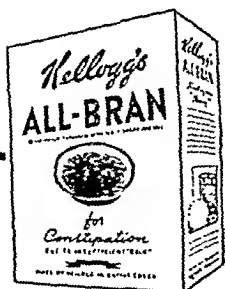


○ Many foods of fibrous content have been suggested as a source of laxative bulk. Such bulk is not available as an eliminating agent, however, unless it reaches the colon undigested.

The effectiveness of Kellogg's All-Bran as a source of bulk lies in the fact that in the average person a large part of its fibrous content does not digest, but provides an ideally soft bulky residual mass in the intestine.

In addition, All-Bran furnishes a significant amount of vitamin B₁, beneficial to the intestinal tonus. Also as a source of iron, All-Bran is especially valuable ... because in All-Bran the iron occurs with copper, thus becoming readily available for making hemoglobin.

These contributions by Kellogg's All-Bran to important physiological functions suggest its use as a dietary aid in constipation resulting from lack of bulk. Made by Kellogg in Battle Creek.



YOU WANT FACTS

It is facts that you want. Not hearsay, nor claims.

Tests were made on five brands of cigarettes to determine their irritant properties. Conclusively these tests prove the definite superiority of Philip Morris.

Reprints of these findings — as well as other researches on the subject of irritation due to smoking — all published in medical journals* — will be sent you on request.

PHILIP MORRIS & CO.



Tune in to "JOHNNY PRESENTS" on the air Coast-to-Coast Tuesday evenings, NBC Network ... Saturday evenings, CBS Network ... Friday evenings, Mutual Network

PHILIP MORRIS & CO., LTD., INC.
119 FIFTH AVENUE NEW YORK

Please send me reprints of papers from

- *Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245 ☐
- Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154 ☐
- N. Y. State Jour. Med. June 1935, Vol. 35, No. 11 ☐
- Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60 ☐

SIGNED _____

ADDRESS _____

CITY _____ STATE _____

PHI

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

September, 1938

Number 9

CONTENTS

	PAGE
Health Hazards in the Dry Cleaning Industry: A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area	1029
<i>William H. Cary, Jr., C.E., and John M. Hepler, C.E.</i>	
Methods of Estimating Postcensal Populations	1042
<i>Henry S. Shryock, Jr., Ph.D.</i>	
Handicaps in the Normal Growth and Development of Rural Negro Children	1048
<i>Hildrus A. Poindexter, M.D.</i>	
A Critical Discussion of Some Methods and Standards for Certified Milk . .	1053
<i>J. Howard Brown, Ph.D.</i>	
A More Effective School Health Program	1059
<i>John T. Phair, M.D., D.P.H.</i>	

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Reliable tuberculin testing
without the use of a needle

TUBERCULIN PATCH TEST (Vollmer)

Lederle

THIS NEW TEST is designed to assure less resistance on the part of the patient and his family to the active program now being conducted to unearth, by tuberculin testing, hitherto undiagnosed cases of tuberculosis.

After cleansing the skin with acetone, the patch is applied like an ordinary strip of adhesive, left in place for 48 hours and the reaction is read 48 hours later.

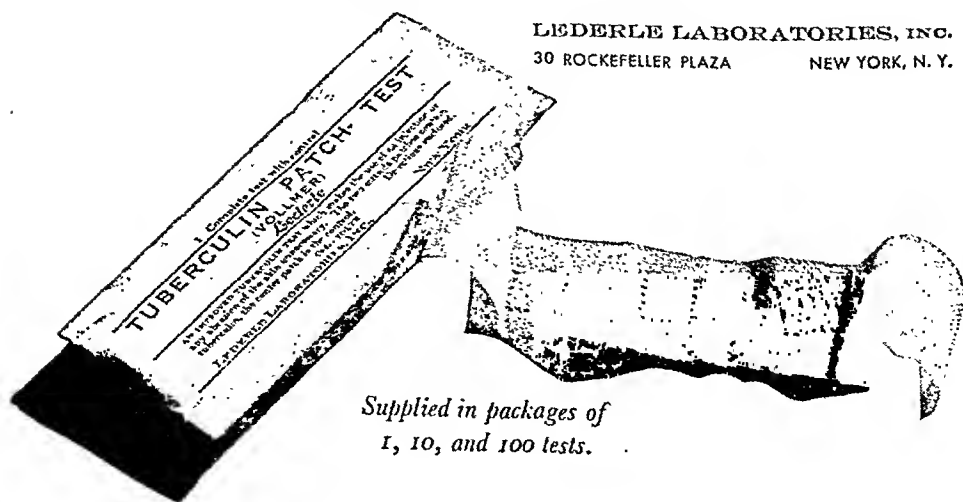
The patient's dread of the needle and the nervous excitement attending the preparations for injection cease to exist as deterrents to the systematic testing of children at home or in schools. Groups in schools and hospitals may often be thus tested without the trouble of obtaining the parents' permission.

"Tuberculin Patch Test (Vollmer)" is accurate, comparing favorably with the Mantoux test. It differs from other patch tests in that the area of reaction is sharply defined and does not spread.

The test is safe; no focal or general constitutional reactions have been reported.

A pledget of cotton, damp with acetone, is all the extra equipment needed to apply the test.

Packages:—1, 10 and 100 tests.



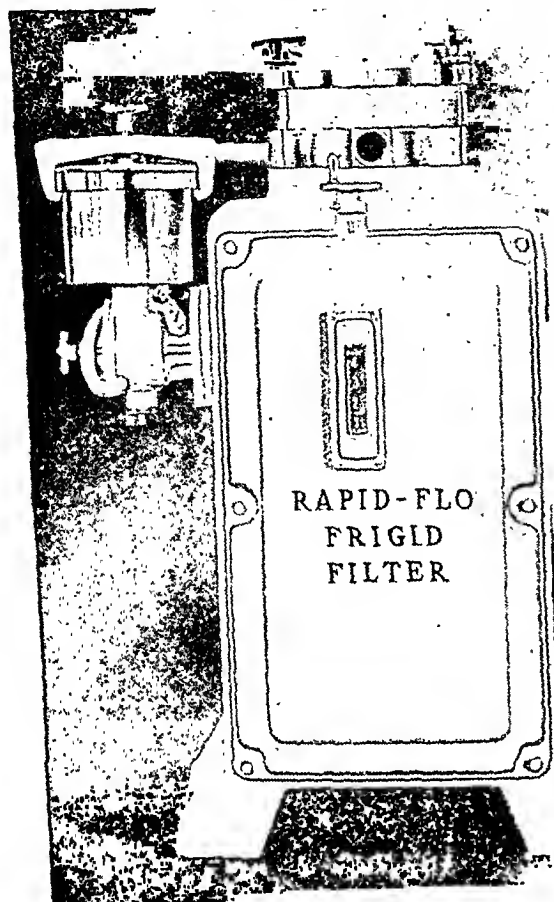
LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA NEW YORK, N. Y.

*Supplied in packages of
1, 10, and 100 tests.*

<i>Contents—Continued</i>	PAGE
Cultural Methods for the Detection of Typhoid Carriers	1065
<i>Elizabeth J. Cope and Joseph A. Kasper, M.D.</i>	
Present Status of Vitamin Milks	1069
<i>E. V. McCollum, Ph.D.</i>	
Postgraduate Education of Physicians in Pediatrics	1072
<i>Myron E. Wegman, M.D.</i>	
Symposium—"What Every Health Officer Should Know":	
Vital Statistics	1077
<i>Jessamine S. Whitney</i>	
Industrial Hygiene	1080
<i>Leverett D. Bristol, M.D., Dr.P.H.</i>	
Health Education	1083
<i>Mary P. Connolly</i>	
Public Health Nursing	1087
<i>Naomi Deutsch, R.N.</i>	
Federal Facilities to Expedite Emergency Sanitation Measures	1091
<i>R. E. Tarbett</i>	
Discussion— <i>J. K. Hoskins, C.E.</i>	1094
Scarlet Fever Control	1096
<i>Edward R. Krumbiegel, M.D.</i>	
National Health Conference: A Review	1103
<i>Reginald M. Atwater, M.D.</i>	
Conference Gleanings	1110
EDITORIALS:	
The New Federal Laws Relating to Foods, Drugs, and Cosmetics	1114
The Airplane and Yellow Fever	1116
New Light on Old Beliefs	1118
Samuel M. Creswell	1120

Continued on page viii

Reprint prices furnished upon request



For Improved Milk Quality... **FRIGID FILTRATION**

IMPROVED milk quality results from filtering milk at 40° F. with the Rapid-Flo Frigid Filter. Sediment is removed as the first operation in the milk plant, before heat is applied. Hot bag filtration tends to dissolve foreign substances. The number of cities with ordinances forbidding hot filtration is increasing all the time. The cost of Frigid Filtration to the

dairy is a fraction of a cent a quart. Frigid Filtration is now in satisfactory daily use in over 200 milk plants. Milk sanitarians and health authorities will be interested in this new process for better milk. The story is told in "Frigid Filtration," copies of which will be sent, gratis, on request to Johnson & Johnson, New Brunswick, N. J. Send for your copy today.



RAPID-FLO FRIGID FILTER

Johnson & Johnson
NEW BRUNSWICK, N. J. CHICAGO, ILL.

SEND FOR THIS BOOK—NO CHARGE!

Contents—Continued

PAGE

Public Health Education—*Evart G. Rontzahn* 1121

Again in October. "Fairy Tales and Neuroses." A State Helps the Locals. When Addressing Mail. Grammar for Writers. Why Not More about National Agency Publications? Many Pictures—Some Words. State Tb. Bulletins. Magazine Articles. State Department Bulletins.

Books and Reports 1127

Occupational Disease Symposium. Life and a Living (Altro Work Shops, Inc.). Teaching for Health. Disease and the Man. Modern Ways With Babies. Atlas of Skeletal Maturation (Hand). Mental Hygiene for Nurses. Les Epidemies et l'Histoire. Public Works Engineers' Yearbook, 1938—including the Proceedings of the 1937 Public Works Congress Held at Atlanta, Ga., Oct. 4-6, 1937. Pneumonia and Serum Therapy. Introduction to Physiological Chemistry (4th ed.) "Marihuana"—The New Dangerous Drug. Physicians' Vitamin Reference Book (E. R. Squibb & Sons). The Nursery Years. Food Values of Portions Commonly Served. Allergy: Its Practical Application. Sanitary Engineering as a Career: A Monograph (from "Careers"). The Biology of Arteriosclerosis. Eat and Keep Fit.

A Selected Public Health Bibliography—*Raymond S. Patterson, Ph.D.* . . 1137

Books Received 1139

Association News 1140

The Kansas City Meeting. Hotel Information. Applicants for Membership.

Employment Service 1145

News from the Field 1147

Conferences and Dates 1152

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.	X	Directory of Health Service.....	XXVI
Book Service	XIV, XXI, XXII	Information Service, A.P.H.A.	
Directory of Exhibits, Annual Meeting, A.P.H.A.	XX, XXI	Eimer & Amend, Inc.....	XXIII
Gifts and Bequests.....	XXIV	Everson Mfg. Co.....	XIX
Membership Application Form.....	XII	Federation of Sewage Works Associations	XXIII
Affiliated Societies and Branches.....	XII	Gilliland Laboratories, Inc., The.....	II
American Can Company.....	XXVII	International Equipment Co.....	XXV
American Telephone & Telegraph Co....	VII	Johnson & Johnson.....	V
Bell Telephone System.....	VII	Kimble Glass Company.....	IX
Canadian Public Health Journal.....	XXVI	Lakeside Publishing Company.....	XXV
Corning Glass Works.....	XIII	Lederle Laboratories, Inc.....	III
Difco Laboratories, Inc.....	Back Cover	National Drug Company, The.....	XV
Directory of Health Service.....	XXVI	Pyrex Laboratory Glassware.....	XIII
Bendiner & Schlesinger Laboratories		Santa Fe Railroad.....	XVI
Black & Veatch		Sewage Works Journal.....	XXIII
Committee on Administrative Practice, A.P.H.A.		Squibb, E. R., & Sons.....	XI
		Trained Nurse, The.....	XXV
		Wallace & Tiernan Co., Inc.....	XVIII
		Wisconsin Alumni Research Foundation..	XVII

BEHIND YOUR GOOD TELEPHONE SERVICE

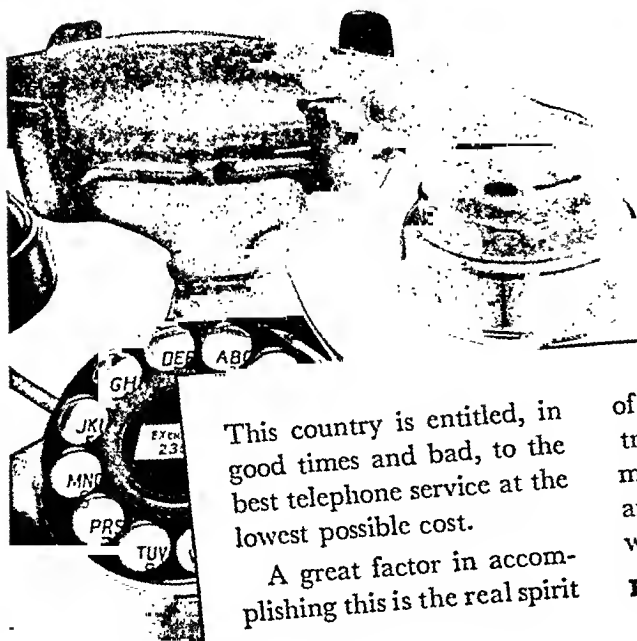
IS THE *Constant Courtesy* OF

THE VOICE WITH A SMILE



THE MAN ON THE JOB

THE MEN AND WOMEN
IN THE TELEPHONE OFFICE



This country is entitled, in good times and bad, to the best telephone service at the lowest possible cost.

A great factor in accomplishing this is the real spirit

of service that has become a tradition among telephone men and women. Courtesy and efficiency are important words in the Bell System.

BELL TELEPHONE SYSTEM



American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

October, 1938

Number 10

CONTENTS

PAGE

Sylvatic Plague 1153
K. F. Meyer, Ph.D., M.D.

Contributions of Edward Jenner to Modern Concepts of Heart Disease . . 1165
O. F. Hedley, M.D.

Alum Precipitated Toxoid for the Prevention of Diphtheria 1170
Archibald S. Dean, M.D., Dr.P.H., and Samuel Hyman, M.D.

Present Status of Safety Education in Some Representative School Systems 1175
John P. Sullivan, Ph.D.

Registration and Approval of Public Health Laboratories as Carried on in
Connecticut 1185
Friend Lee Mickle, Sc.D.

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazýřek P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Type all pneumonias—

PNEUMOCOCCUS TYPING

RAPID—ACCURATE

THE NEUFELD METHOD of type diagnosis has made specific serum therapy practicable.

Typing directly from sputum frequently permits a type diagnosis within a few minutes.

Early specific treatment—so vital to successful serum therapy—is possible only when the pneumococcus type is determined *early*.

Therapeutic sera are now available for a greater number of pneumococcus types. Approximately 75% of all adult pneumococcus pneumonias can be treated by means of specific sera for Types 1, 2, 4, 5, 7, and 8.

"Diagnostic Antipneumococcic Sera (Rabbit), *Lederle*" for typing by the Neufeld reaction, are available in the following packages:

1.0 CC. VIAL

5 capillary tubes for individual tests for each of the monovalent Types and for the following combinations:—

Mixture "A"—containing Types 1, 2 and 7

Mixture "B"—containing Types 3, 4, 5, 6 and 8

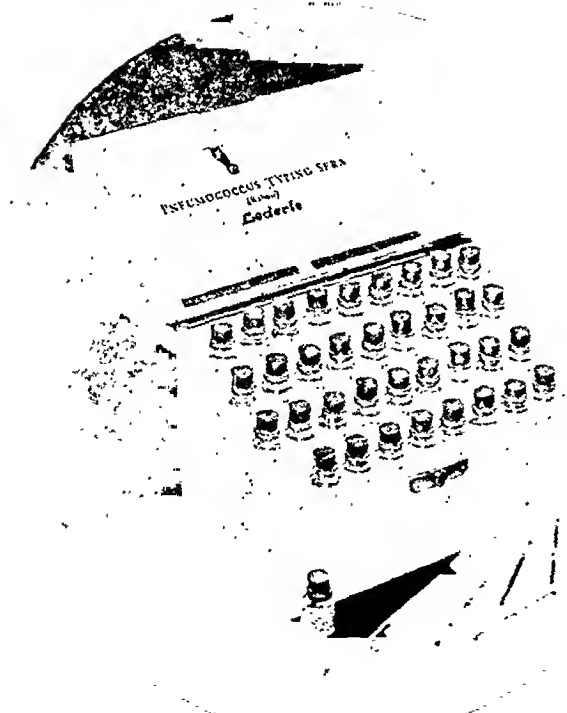
Mixture "C"—containing Types 9, 12, 14, 15 and 17

Mixture "D"—containing Types 10, 11, 13, 20, 22 and 24

Mixture "E"—containing Types 16, 18, 19, 21 and 28

Mixture "F"—containing Types 23, 25, 27, 29, 31 and 32

Lederle



These cases will be furnished to hospitals free of charge with orders for complete typing material.

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA
NEW YORK, N. Y.

Development of International Coöperation Among the Health Authorities
of the American Republics 1193
Hugh S. Cumming, M.D.

Positions and Rates of Pay in Public Health Agencies 1197
Anthony J. Borowski, Dr.P.H.

Trichinelliasis in San Francisco 1203
M. Hobmaier, M.D., and J. C. Geiger, M.D.

An Epidemic of Typhoid Fever Attributed to Salad Contaminated by a
Chronic Typhoid Carrier 1212
Paul A. Lembcke, M.D., and Paul Von Haesseler, M.D.

Dye Concentration in Culture Media Employed for the Analysis of
Escherichia-Aerobacter Members in Milk 1217
Herbert D. McAuliffe and M. A. Farrell

Bovine Mastitis—The Relation of Streptococci to Physical Changes Occur-
ring in the Udders of Dairy Cows 1222
W. T. Miller and H. W. Johnson

An Inexpensive Method for the Dehydration and Preservation of Comple-
ment and Other Biological Materials 1231
Enrique E. Ecker, Ph.D., and L. Pillemer, Ph.D.

Educational Qualifications of Sub-Professional Field Personnel in Sanitation 1233
W. S. Leathers, M.D., Chairman

EDITORIALS:

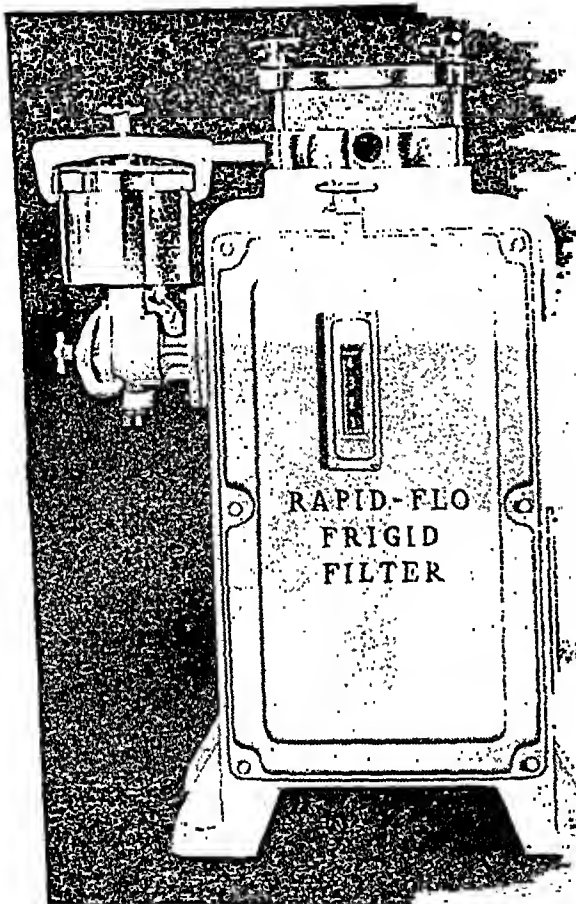
The Sixty-seventh Annual Meeting 1234

Food Poisoning by Staphylococci 1235

Diphtheria Immunization 1236

Continued on page viii

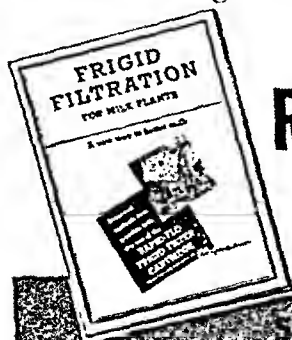
Reprint prices furnished upon request



For Improved Milk Quality... FRIGID FILTRATION

IMPROVED milk quality results from filtering milk at 40° F. with the Rapid-Flo Frigid Filter. Sediment is removed as the first operation in the milk plant, before heat is applied. Hot bag filtration tends to dissolve foreign substances. The number of cities with ordinances forbidding hot filtration is increasing all the time. The cost of Frigid Filtration to the

dairy is a fraction of a cent a quart. Frigid Filtration is now in satisfactory daily use in over 200 milk plants. Milk sanitarians and health authorities will be interested in this new process for better milk. The story is told in "Frigid Filtration," copies of which will be sent, gratis, on request to Johnson & Johnson, New Brunswick, N. J. Send for your copy today.



RAPID-FLO FRIGID FILTER

Johnson & Johnson
NEW BRUNSWICK, N. J. CHICAGO, ILL.

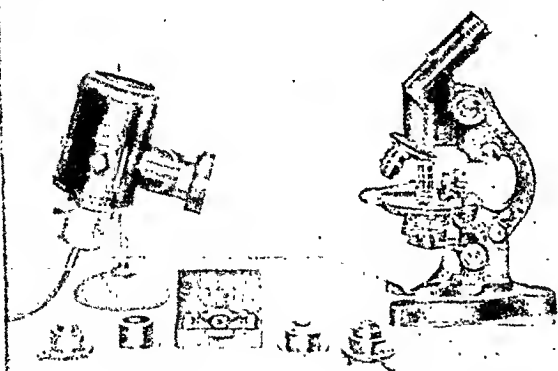
SEND FOR THIS BOOK—NO CHARGE

Contents—Continued

	PAGE
Books and Reports	1238
Life, Heat, and Altitude: Physiological Effects of Hot Climates and Great Heights. The Public Assistance Worker. Practical Physiological Chemistry (11th ed.). The Chemical Analyses of Foods and Food Products. Handbook on Social Hygiene. Syphilis, Gonorrhea, and the Public Health. Nutrition of the Infant and Child. Child Guidance Procedures: Methods and Techniques Employed at the Institute for Juvenile Research. Graphs: How to Make and Use Them. How to Live (20th ed.). The Radiology of Pulmonary Tuberculosis. Bulletin of the Health Organization of the League of Nations (August, 1937). The Diagnosis of Syphilis by the General Practitioner. Sewerage and Sewage Treatment. Jurisprudence for Nurses: Legal Knowledge Bearing Upon Acts and Relationships Involved in the Practice of Nursing (2nd ed.).	
Books Received	1246
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . .	1247
Association News	1249
The Twentieth Annual Health Exhibit. Books at the Annual Meeting. Invitation from Chicago to Delegates en Route to Kansas City. New Members of A.P.H.A. Due to Western Branch Activities. Program of the Institute on the Practical Administration Affairs of the Health Officer 1938 Health Conservation Contests. Serodiagnostics Tests for Syphilis. Association of Women in Public Health. State Directors of Public Health Nursing. Applicants for Membership. Applicants for Fellowship. Deceased Members.	
Employment Service	1258
News from the Field	1260
Conferences and Dates	1267

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.	X	Federation of Sewage Works Associations	XXI
Book Service	XIV, XIX	Frosted Foods Sales Corp. (Birds Eye)...	1268
Directory of Exhibits, Annual Meeting A.P.H.A.	XVIII, XIX	Gilliland Laboratories, Inc., The.....	II
Membership	XII	Johnson & Johnson.....	V
Affiliated Societies and A.P.H.A. Branches	XII	Kellogg's All-Bran	XVII
American Can Company.....	XXIII	Lederle Laboratories, Inc.....	III
Canadian Public Health Association.....	XX	Leitz, E., Inc.....	VII
Cargille, R. P.....	1268	Municipal Sanitation	XXII
Difco Laboratories, Inc.....	Back Cover	National Drug Company, The.....	XI
Directory of Health Service.....	XVII	N.O.P.H.N.	XX
Bendiner and Schlesinger Laboratories		Public Health Nursing.....	XX
Black & Veatch		Sealtest, Inc.	XIII
Committee on Administrative Practice, A.P.H.A.		Sewage Works Journal.....	XXI
Employment Service, A.P.H.A.		Squibb, E. R., & Sons.....	IX
Everson Mfg. Co.....	VII	Trained Nurse, The.....	XXI
		Vitex Laboratories	XV
		Wallace & Tiernan Co., Inc.....	XVI



Leitz

DARKFIELD CONDENSERS

MODERN microscopic accessories are vital factors for the practical execution of the present drive towards the eradication of syphilis. LEITZ DARKFIELD CONDENSERS are known wherever the investigation of living bacteria becomes routine. They are easy to manipulate and instantaneous in their results.

Ask for Bulletin No. 7059-Q

E. Leitz, Inc., 730 Fifth Avenue, New York



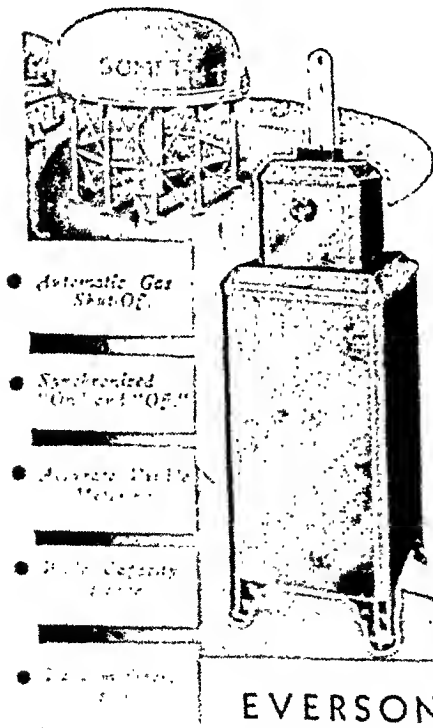
Spirochaeta Pallida

The New EVERSON "Automatic Vacuum Control" CHLORINE STERILIZER

This new Chlorine Control Apparatus is the result of extensive work in developing and perfecting Chlorine equipment especially adaptable for water works and sewage applications.

This new instrument measures and feeds Chlorine Gas as a solution, has many new and improved features which make it automatically safe and accurate. Briefly it embodies the following designed features: Accurate, visible control of gas flow; Great capacity range—ratios from 1½ to 65; only two moving parts; single valve control automatic gas shut-off; electrically operated water shut-off—synchronizes "on" and "off" of sterilizer with that of pump; complete vacuum feed, water sealed gas vent with syphon break—all parts easily accessible and entirely noncorrosive—parts which contact chlorine as gas or in solution are rubber, glass, silver or tantalum; Standard (SAE) threads and parts for easy servicing, etc.

This new Sterilizer, which though complete in up-to-the-minute features, will be in the "low price field". Write for complete data!



- Automatic Gas Shut-Off
- Synchronized "On" and "Off"
- Automatic Water Shut-Off
- Single Valve Control
- Electrically Operated
- Water Sealed Gas Vent
- Syphon Break
- Noncorrosive Parts
- Standard (SAE) Threads and Parts

**EVERSON
MFG. CO.**

209 W. HURON STREET - - - CHICAGO, U. S. A.

Write for complete data!

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

November, 1938

Number 11

CONTENTS

	PAGE
Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts	1269
<i>C.-E. A. Winslow, Dr.P.H.</i>	
Administrative Control of Food Handlers and Places Dispensing Food and Drinks	1277
<i>Katherine Marden, Joseph M. Curry, D.V.S., Louis J. Horowitz, and Benjamin G. Horning, M.D.</i>	
Projection of Public Health Engineering in New York State	1285
<i>W. H. Larkin, C.E.</i>	
Time-Study of Morbidity and Mortality in the United States Navy . . .	1291
<i>John M. Wheelis, Jr., M.D.</i>	

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00 for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Probably 70% of all cases of
lobar pneumonia can be treated with—

ANTIPNEUMOCOCCIC SERA

TYPES 1, 2, 4, 5, 7 AND 8

WITH A RESULTANT saving of over 40,000 lives
annually in the United States.

IN RECENT YEARS an average of 100,000* deaths per
year have been attributed to lobar pneumonia alone.

Calculating from the known relative frequencies
of the individual pneumococcus types, and from the
mortality rate when no serum is given, 225,000 cases
and 67,000 deaths are caused by Types 1, 2, 4, 5, 7,
or 8, pneumococci.

19 out of every 31 deaths can be avoided* by ade-
quate specific serum therapy, administered during the
first four days of illness; in other words, more than
40,000 of these deaths are preventable.

Potent, refined and concentrated "Antipneumo-
coccic Sera *Lederle*" are available in the
following packages:

Bivalent Types 1 and 2, Bivalent Types
4 and 8, Bivalent Types 5 and 7, Mono-
valent Type 1 and Monovalent Type 2.
These are horse sera and are all "Council
Accepted".

A survey of the literature indicates
that the types enumerated here are
responsible for more than 70% of all
cases of pneumococcic infection, no
matter how manifested (lobar or bron-
chial pneumonia, empyema, etc.).

*Horsfall, F. L., Canadian Pub. Health J.; October,
1937

Lederle

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA NEW YORK



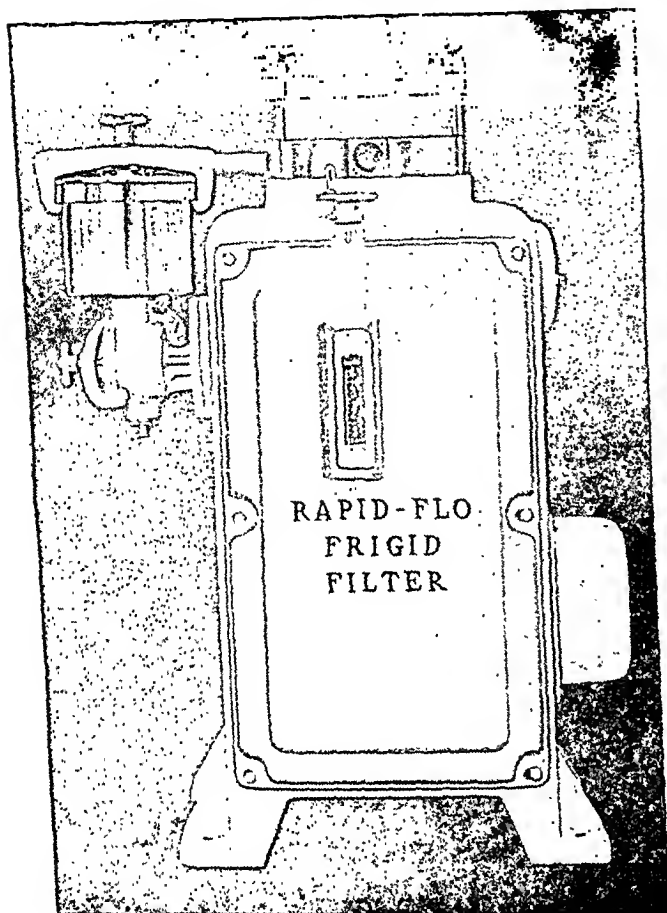
Progress Under the Operation of Title VI of the Social Security Act . . .	1298
<i>C. E. Waller, M.D.</i>	
Fleas as Vectors of Plague	1305
<i>C. R. Eskey, M.D.</i>	
Tenure of Office for Health Officers	1311
<i>Joseph W. Mountin, M.D., and Elliott H. Pennell</i>	
Population Growth—Its Vital Statistics and Public Health Aspects	1319
<i>Warren S. Thompson</i>	
Practical Experience with the Scharer Rapid Field Test for Pasteurization	1325
<i>D. M. Roger</i>	
Health Maintenance in Industry	1328
<i>Clarence D. Selby, M.D.</i>	

EDITORIALS:

Patent Medicines and Advertisers	1332
Bovine Tuberculosis in Children	1334
The Fear of Air Raids	1334
An Unusual Suicide	1336
Public Health Education— <i>Evart G. Routzahn</i>	1338
Syndicated Health Education. Exhibits All the Year Round. How About Staff Conferences? Exhibits and Museums. Mimeography Need Not Look Dull. Much Wanted. For Education and Reference. Magazine Articles. Reporting. Motion Pictures. Radio.	

Continued on page viii

Reprint prices furnished upon request



**For
Improved
Milk Quality...
FRIGID
FILTRATION**

IMPROVED milk quality results from filtering milk at 40° F. with the Rapid-Flo Frigid Filter. Sediment is removed as the first operation in the milk plant, before heat is applied. Hot bag filtration tends to dissolve foreign substances. The number of cities with ordinances forbidding hot filtration is increasing all the time. The cost of Frigid Filtration to the

dairy is a fraction of a cent a quart. Frigid Filtration is now in satisfactory daily use in over 200 milk plants. Milk sanitarians and health authorities will be interested in this new process for better milk. The story is told in "Frigid Filtration," copies of which will be sent, gratis, on request to Johnson & Johnson, New Brunswick, N. J. Send for your copy today.



RAPID-FLO FRIGID FILTER

Johnson & Johnson
NEW BRUNSWICK, N. J. CHICAGO, ILL.

SEND FOR THIS BOOK—NO CHARGE

Contents—Continued

	PAGE
Books and Reports	1343
Occupational Diseases in Ohio: Annual Report for 1937. Osler's Principles and Practice of Medicine (13th ed.). Vitamin B ₁ (Thiamin) and Its Use in Medicine. Technics for the Bacteriological Examination of Drinking Glasses. Macleod's Physiology in Modern Medicine (8th ed.). Cause and Prevention of Disease. A Textbook of General Bacteriology (12th ed.). Pasteur: Knight of the Laboratory. The Laboratory Diagnosis of Syphilis. Dynamic Causes of Juvenile Crime. Social Agency Boards and How to Make Them Effective. Fearfully and Wonderfully Made: The Human Organism in the Light of Modern Science. American Foundations for Social Welfare. Das Leben der Frau. Successful Living. Swimming and Diving (by American Red Cross).	
Books Received	1354
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . .	1355
Association News	1357
Officers, 1938-1939. Sedgwick Memorial Medal Awarded Wade Hampton Frost, M.D. Statement of Dr. Leonides Andreu Almazan. Applicants for Membership. Correction. Publication Needed.	
Employment Service	1363
News from the Field	1365
Conferences and Dates	XVII

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.		Everson Mfg. Co.....	XIX
Book Service	XII, XIV, XVIII	Federation of Sewage Works Associations..	XXII
Gifts and Bequests.....	XX	Gilliland Laboratories, Inc., The.....	II
Membership Application Form.....	X	International Equipment Co.....	XVIII
Affiliated Societies and Branches.....	X	Johnson & Johnson.....	V
American Can Company.....	XXIII	Kimble Glass Company.....	IX
American Telephone & Telegraph Co.....	VII	Lakeside Publishing Company.....	XIII
Bell Telephone System.....	VII	Lederle Laboratories, Inc.....	III
Canadian Public Health Journal.....	XXI	National Drug Company, The.....	XV
Disco Laboratories	Back Cover	National Organization for Public Health Nursing	XXI
Directory of Health Service.....	XXII	Philip Morris & Co., Ltd., Inc.....	XIII
Bendiner & Schlesinger Laboratories		Public Health Nursing.....	XXI
Black & Veatch		Sewage Works Journal.....	XXII
Book Service, A.P.H.A.		Squibb, E. R., & Sons.....	XI
Committee on Administrative Practice, A.P.H.A.		Trained Nurse, The.....	XIII
Eimer & Amend, Inc.....	XIX	Wallace & Tiernan Co., Inc.....	XVI

THE VOICE WITH A *Smile*



NORTH



SOUTH



EAST



WEST

It may carry the salty twang of New England or the soft accents of the South.

It may be swift and crisp in the New York manner or full of the pleasant rolling r's in the style of the West.

But wherever you hear it, it will be friendly, courteous, and efficient.

It's the all-American voice of the Bell Telephone operator -- "The Voice with a Smile."

The entire Bell System seeks to serve you quickly, capably and in the spirit of a friend.



BELL TELEPHONE SYSTEM

The Bell Telephone System is a part of the Bell System.

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28 December, 1938 Number 12

CONTENTS

	PAGE
A Century in Arrears	1369
<i>Presidential Address</i>	
<i>Abel Wolman, Dr.Eng.</i>	
The Health of the Nation	1376
<i>Thomas Parran, M.D., Dr.P.H.</i>	
Present Status of Dental Caries in Relation to Nutrition	1381
<i>Nina Simmonds, Sc.D.</i>	
Development of Industrial Hygiene in the United States	1388
<i>J. J. Bloomfield</i>	
Annual Index	Supplement

Continued on page vi

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. These are not to be regarded as expressing the views of the American Public Health Association unless formally adopted by vote of the Association.

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Reader's Guide in your library.

Published by the American Public Health Association at 374 Broadway, Albany, N. Y.
Executive Office, 50 West 50th Street, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States, Cuba and Mexico; \$5.50 for Canada and South America; and \$6.00. for other countries. Single copies 50 cents postpaid. Copyright, 1938, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor, Mazzyck P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 374 Broadway, Albany, N. Y., or 50 W. 50th St., New York, N. Y.

Entered as second-class matter at the Post Office at Albany, N. Y., September 17, 1932.

Prevent the dangerous complications of

WHOOPING COUGH

WITHIN RECENT YEARS, the mortality from whooping cough has exceeded the death rate from diphtheria, scarlet fever and measles combined. Whooping cough is nearly if not quite as contagious as measles and far more dangerous to children in the earliest age groups.

The main cause for concern, when whooping cough occurs, remains the high incidence of complications—chiefly bronchopneumonia.

"Pertussis Antigen (Detoxified) Lederle" offers a promising agent for the control of this disease. Clinicians have reported favorably concerning this product when it is used early in the course of the disease. The use of this

product for the prevention of whooping cough in intimately exposed contacts has also given gratifying results.

Most striking has been the observation that the incidence of interstitial or bronchial pneumonias has been sharply reduced in cases treated with this antigen.

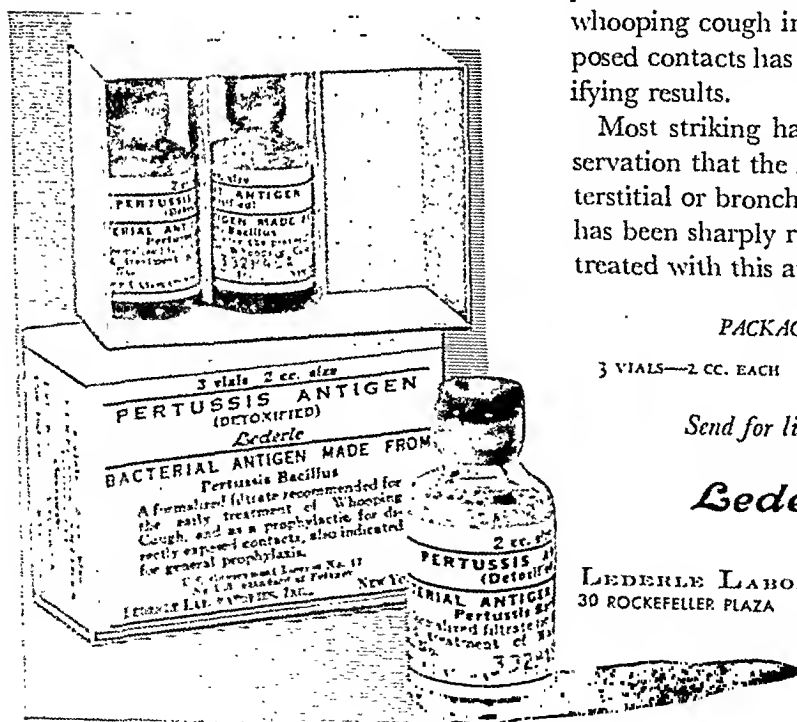
PACKAGES:

3 VIALS—2 CC. EACH 1 VIAL—20 CC.

Send for literature

Lederle

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA NEW YORK, N. Y.



Value of the Vital Statistics Data on Birth and Death Certificates in County
Health Work 1398
Earle G. Brown, M.D.

Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine
Encephalomyelitis 1403
Roy F. Feemster, M.D., Dr.P.H.

Rocky Mountain Spotted Fever and Tick Survey in Iowa 1411
Carl F. Jordan, M.D., C.P.H.

The Probable Typhoid Carrier Incidence in Mississippi 1415
A. L. Gray, M.D., M.P.H.

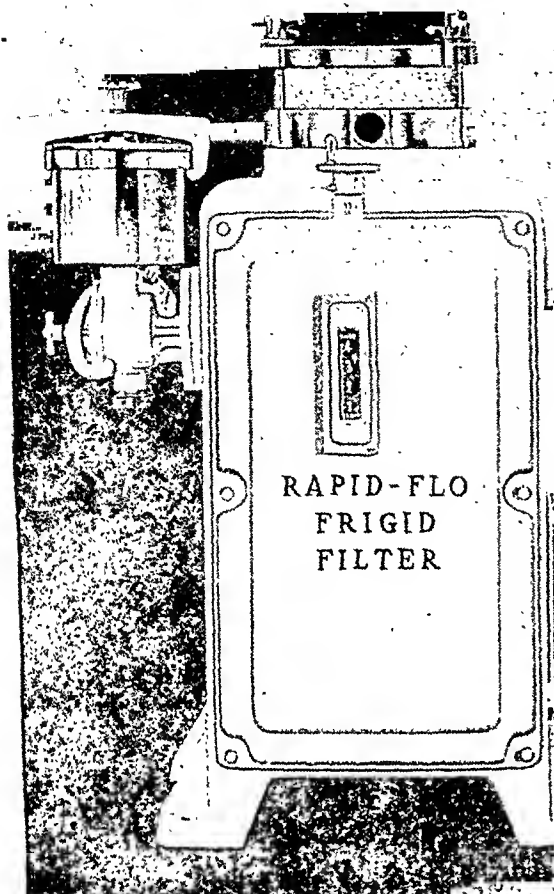
EDITORIALS:

Our Sixty-Seventh Annual Meeting 1420
Edward S. Godfrey, Jr. 1422
John Shaw Billings—Born April 12, 1838 1423
Raw or Pasteurized Milk? 1424

Public Health Education—*Evert G. Routzahn* 1426
Never Again, Promises the Section. Excellent Exhibit Setting. Better Write
Quickly. The Date Please. Where Is a Picture of Jenner? "If Any Money
Is Left Over." It Can Be Done. Misinformation Sources. How the House
Organ Is Addressed. Get Them Into Courses. For Prospective Fathers. A
Different Report. Don't Unbalance the Diet. A Gay Health Play for Adults.
"Preventive" or Not "Preventive"? What Would You Have Said? Magazine
Articles. New. Wanted.

Continued on page viii

Reprint prices furnished upon request



For Improved Milk Quality... **FRIGID FILTRATION**

IMPROVED milk quality results from filtering milk at 40° F. with the Rapid-Flo Frigid Filter. Sediment is removed as the first operation in the milk plant, before heat is applied. Hot bag filtration tends to dissolve foreign substances. The number of cities with ordinances forbidding hot filtration is increasing all the time. The cost of Frigid Filtration to the

dairy is a fraction of a cent a quart. Frigid Filtration is now in satisfactory daily use in over 200 milk plants. Milk sanitarians and health authorities will be interested in this new process for better milk. The story is told in "Frigid Filtration," copies of which will be sent, gratis, on request to Johnson & Johnson, New Brunswick, N. J. Send for your copy today.



RAPID-FLO FRIGID FILTER

Johnson & Johnson
NEW BRUNSWICK, N. J. CHICAGO, ILL.

SEND FOR THIS BOOK—NO CHARGE!

Contents—Continued

PAGE

Books and Reports 1432

Public Health and Medical Licensure in the State of Mississippi, 1798-1937.
The Hospital Head Nurse. Science in Our Lives. Posture and Exercise for
Young Children. Health, Hygiene and Hooey. In the Name of Common Sense:
Worry and Its Control. Industrial Hygiene: A Handbook of Hygiene and
Toxicology for Engineers and Plant Managers. A Historical Chronology of
Tuberculosis. An Introduction to Medical Statistics.

Books Received 1437

A Selected Public Health Bibliography—*Raymond S. Patterson, Ph.D.* . . 1438

Association News 1441

Resolutions Passed at Kansas City. New Affiliated Societies. Applicants for
Membership.

Standard Methods for the Examination of Dairy Products—Changes in New
Edition—*Robert S. Breed, Ph.D., Chairman* 1447

Employment Service 1449

News from the Field 1451

Conferences and Dates XVII

INDEX TO ADVERTISERS

	Page		Page
A. P. H. A.....	X	Diversey Corporation, The.....	XVII
Book Service	XIV, XV, XVIII	Eimer & Amend.....	XIX
Gifts and Bequests.....	XX	Everson Mfg. Co.....	XIX
Membership Application Form.....	XII	Federation of Sewage Works Associations	XXI
Affiliated Societies and A.P.H.A. Branches	XII	Gilliland Laboratories, Inc., The.....	II
American Can Company.....	XXIII	Johnson & Johnson.....	V
Canadian Public Health Association.....	XVIII	Kellogg's All-Bran	VII
Difco Laboratories, Inc.....	Back Cover	Lakeside Publishing Company.....	XXI
Directory of Health Service.....	XXII	Lederle Laboratories, Inc.....	III
Bendiner and Schlesinger Laboratories		National Drug Company, The.....	XI
Black & Veatch		N.O.P.H.N.	XXII
Committee on Administrative Practice,		Public Health Nursing.....	XXII
A.P.H.A.		Spencer Lens Company.....	VII
Information Service, A.P.H.A.		Squibb, E. R., & Sons.....	IX
		Wallace & Tiernan Co., Inc.....	XVI
		Wisconsin Alumni Research Foundation..	XIII

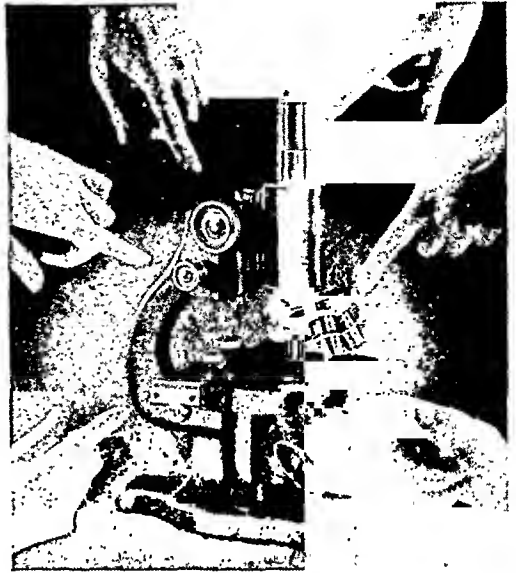
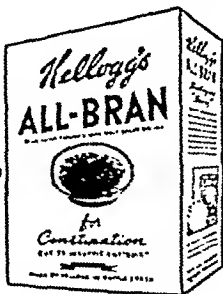
Some
Medical Aspects
of
Kellogg's
ALL-BRAN
as an aid to
elimination

- 1 Medical authority concedes that "bulk," provided by food residues, assists efficient elimination.
- 2 Medical authority ascribes to vitamin B₁ the important property of improving the tonus of the intestines.

Regular use of Kellogg's All-Bran supplies helpful "bulk." This food also contains vitamin B₁ in appreciable quantity.

These facts provide a sound medical basis for recommending Kellogg's All-Bran as a valuable aid in the prevention or relief of constipation due to lack of "bulk." Made by Kellogg's in Battle Creek.

A NATURAL LAXATIVE CEREAL



Lifetime
Precision Features

The many exclusive mechanical refinements built into the Spencer No. 33 MH Microscope assure "new instrument accuracy" throughout a lifetime of use.

1. Forged brass arm, of fine homogeneous grain structure provides lasting strength and rigidity and retains its original trueness.
2. Micrometer type fine adjustment with chromium plated slide bearings and specially designed oil grooves, guarantees smooth operation and enduring accuracy.
3. Dual-cone nosepiece with twice the usual bearing surface maintains more accurate alignment of the objectives.
4. Fork-type substage facilitates convenient interchange of condensers and provides permanent optical alignment.
5. Bright parts plated with rhodium assure maximum resistance to chemical reagents.

"Lifetime Precision" is the creed of Spencer scientists and craftsmen.

Write Dept. M-19 for descriptive literature

Spencer Lens Company

MICROSCOPES
MICROTOMES
PHOTO-
MICROGRAPHIC
EQUIPMENT



REFRACTOMETERS
COLORIMETERS
SPECTROMETERS
PROJECTORS

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

January, 1938

Number 1

An Equal Opportunity for Health^{*}

THE HONORABLE HERBERT H. LEHMAN

Governor of the State of New York, Albany, N. Y.

SIXTY-SIX years ago, on April 18, 1872, New York City became the birthplace of this Association, when your founders first met here to formulate the basic principles of public health coöperation which have now permeated the nation. You have honored both the city and state of your birth by coming home from time to time so that we can rejoice in your splendid progress.

Now, in your maturity, we welcome you home once again.

You may recall that the late Stephen Smith, your distinguished first President, who only a few years ago died at the age of 99—placed the normal duration of human life at 100 years instead of the biblical span of three score and ten. The practical realism of Dr. Smith's prophecy is revealed in the fact that since 1900 ten whole years have been added to our life span.

It is my firm conviction, often repeated, that so far as science and government can make it possible, an equal opportunity for health is the right of all citizens of the community,

regardless of circumstances, birth, economic conditions, geographical limitations, race, creed, or color.

Public interest in hygiene and health can be made effective only when it can be concentrated in the carrying out of a definite plan. This plan should be subject to continuous revision so that full advantage may be taken of both scientific and administrative improvements in the field of public health.

Definite plans require expert preparation and supervision, with official recognition of the maxim that the health of the people is indeed the highest law.

I am proud to be able to say that during the past quarter century the State of New York has recognized the full logic of the statement made in 1913 by that eminent physician and humanist, Sir William Osler, when he said: "Were the health of the people made a question of public and not of party policy, only a skilled expert could possibly be appointed as a public health officer, not, as is now so often the case, the man with the political pull."

Suffice it to say that the guidance of the public health activities of the State of New York since 1914 has been in

^{*} Presented to the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

the hands successively of Hermann M. Biggs, Mathias Nicoll, Jr., Thomas Parran, and now Edward S. Godfrey, Jr., all eminent practitioners of your profession and appointed solely on the basis of their outstanding technical and personal achievements in the field of public health.

The record speaks for itself. In 1913 the death rate in the state for all communicable diseases was 419 per 100,000 population; in 1936 it was 151—a decrease of 64 per cent. Tuberculosis mortality has declined more than one-half since 1913; and the general death rate has declined almost 24 per cent. Both typhoid fever and diphtheria, once very prevalent, are now rare diseases both with a death rate of 0.5 per 100,000 population.

If the death rates of 1913 from these several causes had continued to prevail, there would have been in 1936, 48,000 more deaths from all causes in New York State. Of the infants now living, 11,300 would have died. Additional deaths from tuberculosis would have amounted to 12,400; typhoid fever, 1,300; and from diphtheria, 2,500.

That the economic condition of a community bears a very direct and potent relation to the health and welfare of its citizens is a conviction which has continued to grow upon me for many years.

In 1933 we were in the midst of an economic cataclysm that affected the well-being of every man, woman, and child, and threatened the security even of the state itself. Fear and panic were on every hand. Thousands were without adequate food, shelter, or work. Man was stunned and bewildered by forces which engulfed him and from which there appeared to be no escape. Man had lost hope. New York, like her sister states, had suffered in the midst of national and international adversity. Like all other

governments, the State of New York faced the problem of fitting its aspirations of public service into the reduced limits of its treasury.

I said in 1933 and repeat now: "The significant thing is that financial considerations have not compelled us to waver too greatly from our ideals of the community services which the state must perform . . . essential protection for the security and well-being of our citizens still persists. I pray it will always continue to persist in our enlightened commonwealth."

Conditions during those trying days required immediate relief through emergency legislation and emergency administration.

Our laws quite simply recognized the responsibility of the state to provide food, clothing, shelter, and medical care for those who otherwise would be without it. In spite of decreased public revenue our state has maintained the lead among all others of the nation in the relief of the distress of unemployment. The legislature has appropriated state funds to help cities and counties give the necessities of life to those who were temporarily dependent through no fault of their own. At one time, more than one-sixth of the population of the state, including 800,000 or one-fourth of all our children, were provided with these necessities of life. The total expenditure of public funds in the state in nearly 6 years of public assistance, amounts to approximately one and one-quarter billions of dollars.

To achieve our goal of an equal opportunity for health and adequate medical care, we have emphasized that there must be an increasing degree of whole-hearted coöperation between public health officers, private physicians, and the welfare agencies of any community.

During the economic crisis, emergency action was necessary. We have

followed the famous advice given by John Hunter to his illustrious pupil, Edward Jenner, when he said, "Don't stop with thinking, try!" By both trying and thinking during the past 5 years, emergency action has become less and less necessary. Permanent social and economic reforms have been planned and executed.

Let me review for you some evidence of the ways in which this permanent protection is being developed for the health of citizens of New York State.

Since January 1, 1933, with my full support as Governor of this state, for a period of almost 5 years, a concerted attempt has been made to develop and provide for each locality an equality of opportunities for adequate public health and medical services.

The new activities and programs which have been undertaken or extended have not been stereotyped in pattern but have been sufficiently flexible so that new methods and administrative policies could be developed and tested—in the cold light of the effectiveness with which they provide adequate health services to the individual citizen and the extent to which they represent an efficient expenditure of public moneys.

The most significant new activity conducted by the Department of Health of the State of New York involves an unremitting effort to secure a thoroughgoing reorganization of local health services to the end that disparities might be eliminated and that the support of adequate services might be spread more economically over a larger tax base.

Conceivably the objective could be achieved in one of two ways—namely, by the promotion of county health departments with financial assistance from the state, or by the provision of necessary professional and technical serv-

ices by the state itself through expansion of state health district activities. To eliminate the inadequacies and disparities in the town and village systems for health service, emphasis during the past 5 years has been placed upon both of these alternative methods.

My good friend, Thomas Parran, then State Commissioner of Health—now Surgeon General of the U. S. Public Health Service and President of your Association—in his annual report to me for the year 1934, said: "In spite of the material financial inducement to counties to organize health departments, little progress can be recorded in 1934. The present town and village system for health service is inadequate. The people in the rural areas are sorely in need of more effective health protection measures. If the counties, themselves, are unwilling with state aid to organize the health services, the only alternative seems to be for the state, itself, to operate many services heretofore considered a local responsibility."

Edward S. Godfrey, Jr., our present Commissioner of Health, said, later in the year 1935, in a public address: "I submit that local interest and support can be developed for a system of state districts each under a whole-time health officer as well as for a system of locally operated departments. Public health service always expresses itself locally, whether in services to an individual, a family, a group, or to a community."

The record shows my hearty endorsement of the practical suggestions made by these two outstanding public health administrators.

Now, in 1937, I am happy to announce the fruition of certain projects in which I have been deeply interested during my service as Governor. These include: The rebuilding of the State Reconstruction Home at West Haverstraw—to provide adequate and mod-

ern facilities for the treatment of remediable crippled children; the completion and opening of three new state hospitals for tuberculosis; the inauguration of expanded programs for the control of syphilis, pneumonia, and cancer; the better implementing of the District Offices of the State Health Department—for the development of broader and better local health services; and, the tremendous progress which has been made in the construction of needed sanitary improvements in the municipalities of this state during the past 5 years—under the stimulus of state and federal aid.

Today we have more than 12 million of our citizens resident in communities served by public water supply systems under the supervision of the engineers of the State Department of Health. With respect to the elimination of objectionable pollution in our own and neighboring states we have achieved more during the past few years than in the preceding three decades. More people are served by sewage treatment works constructed in this state since 1933, than are served by all such plants constructed prior to that date.

Sanitary supervision over some 3,000 camps, 3,000 summer hotels and 2,000 artificial swimming pools is doing much to safeguard the health of almost 3 million persons annually among the vacationing and traveling citizens of this and other states.

We point with pride to the pioneer work by our Bureau of Milk Control and other divisions of the State Health Department in the experimental development and practical application of the newly adopted phosphatase test, to determine the efficiency of pasteurization, which bids fair to revolutionize milk control policies throughout the United States.

Tremendous strides have been made

by New York State during the past few decades in the reduction of deaths from certain causes by the application of principles of medical and sanitary science. Yet, in the light of present knowledge, much further improvement is obtainable.

An estimate by an eminent authority, Louis I. Dublin, of the Metropolitan Life Insurance Company, if applied to Continental United States, reveals a possible saving of about 600,000 lives every year, of whom about one-fourth, or 125,000, would be children in the first 5 years of life. One-tenth of this potential saving could be attained conceivably in New York State alone.

To achieve this goal, present local health services must be maintained; victories over specific diseases such as diphtheria, typhoid fever, and tuberculosis must be consolidated; and fresh and intensive attacks must be launched along new fronts.

I will refer briefly to a few of these new programs which have been close to my heart and have been made possible by the splendid cooperation of the Legislature.

I am reliably informed that 12,000 lives are sacrificed each year in New York State to the ravages of pneumonia. In January, 1936, I was happy to launch a state-wide campaign for pneumonia control—in which it was emphasized that although there are 32 types of pneumonia germs, Type I is by far the most common variety, and that the state was prepared to furnish a potent and reliable serum for its treatment. It had been shown that this serum could cut the number of Type I pneumonia deaths in half or even by two-thirds.

In the short period of 1½ years this demonstration, started jointly under private and public auspices, has shown the effectiveness of rapid and positive means of identifying pneumonia, and

has demonstrated that efficient antisera can be produced to combat certain of the more common types of the disease. I am informed by Dr. Godfrey that the use of Type I pneumonia serum produced by the State Department of Health has already saved many lives and has prevented serious, disabling complications in hundreds of others—thereby saving expense, suffering, and worry.

In the eyes of a progressive state these results made additional support for this life-saving program almost mandatory and, on April 24, 1937, I signed a legislative appropriation which made available to the State Department of Health, \$400,000 for use in "Furthering and Promoting the Efficient Prevention, Diagnosis, Treatment, and Control of Pneumonia." I am told that under this new appropriation it soon will be possible to provide sera for the treatment of more than half of our pneumonia cases and that subsequent research should bring the total to nearly 100 per cent.

In 1936, syphilis was responsible for 87,350 cases and 1,258 deaths, reported in New York State, including New York City, and stood first in the number of cases among all the reportable diseases and was exceeded in deaths only by pneumonia and tuberculosis. Yet syphilis is a preventable disease for which specific treatment has long been known.

An intensive state-wide syphilis control program was started more than 2 years ago with the aid of added appropriations made by the 1935 Legislature. These and subsequent state appropriations together with federal assistance under the Social Security Act have put New York State well on the way to meet the challenge made by Dr. Parran, in his recent book, *Shadow on the Land*, when he said: "In not a single state of this country have we

completely adequate free treatment even for the indigent."

Until very recently false modesty has interfered with a free discussion of syphilis. I am very glad to have had an active part in breaking the conspiracy of silence in New York State with regard to syphilis by public addresses on the subject and by my signature in May, 1937, of a law which changes the name of the Division of Social Hygiene in the State Department of Health to the "Division of Syphilis Control."

Early diagnosis and prompt treatment is productive of results not only in the treatment of communicable diseases such as tuberculosis, pneumonia, and syphilis, but also in the treatment of such a disease as cancer which was responsible for more than 19,000 deaths in New York State in 1936 of which almost half were in the state exclusive of New York City.

At a clinical congress of the American College of Surgeons some time ago it was stated: "If all the cases of cancer could be diagnosed early and treated promptly in their incipiency the annual number of deaths from this disease, now recorded as 150,000 in the United States and Canada, would be reduced by at least 33 per cent or 50,000 per year." In a special message to the Legislature on February 18 of this year I called attention to the lack of "available facilities for the treatment of those suffering with cancer . . . especially for those in the lower economic scale." I also said: "I am convinced that the people of this state do not wish these conditions to continue." This conviction on the part of both myself and the State Legislature with regard to cancer control has resulted in the appointment of a Temporary Cancer Commission and in an appropriation of \$510,000 for the purchase of a site and the erection of

a 100 bed cancer hospital to implement and make more available to the citizens of the state the treatment and research facilities of the State Institute for Malignant Diseases in the City of Buffalo. Comparable action for all of the states has since been taken by the Congress and President of the United States.

To call attention to this problem and the need for educating the public to call a physician in time, once again I propose to designate by official proclamation the first week of November as "Cancer Crusade Week."

As we emerge from the depression, we must all solidify the gains we have won with so much difficulty. Some modifications may well have to be made, but, by and large, the essentials of the economic, social, and health reforms we have achieved, should remain as permanent fixtures in our body politic. With a true sense of public responsibility uppermost in the minds of all our people, we will recognize that, although the years to come will require other new changes and new plans—together we shall press steadily onward in our March of Progress.

Records Handbook

THE National Organization for Public Health Nursing has published a new handbook on records entitled, "Suggestions for Statistical Reporting and Cost Computation in Public Health Nursing," which supersedes the one prepared in 1932 by a joint committee of that organization and the U. S. Children's Bureau.

There are two sections, the first on the statistical report of public health nursing services, and the other on computing the cost of a visit. The definitions, instructions, and tabulation forms in the first section conform with those approved by the State and Territorial Health Officers, the U. S. Public Health Service, and the U. S.

Children's Bureau in 1936, which are included in *Reprint No. 1768* from *Public Health Reports*. Also, the report form has been planned to make the data with reference to public health nursing service, required for the American Public Health Association Appraisal Forms, available.

The methods described for determining the cost of the nursing visit, while not applicable in their entirety to the nursing service rendered by public agencies, will be of interest to health departments contemplating studies of such cost.

The handbook can be ordered from the National Organization for Public Health Nursing, 50 West 50 Street, New York, N. Y., at 25¢ per copy.

The Familial Aggregation of Infectious Diseases*

WADE H. FROST, M.D., F.A.P.H.A.

*Professor of Epidemiology, School of Hygiene and Public Health,
Johns Hopkins University, Baltimore, Md.*

ONE of the most characteristic features in the epidemiology of the common acute communicable diseases is the grouping of cases in time and space; and this is especially apt to be noted in the group which constitutes a household, people in close contact with each other, sharing a common environment, mostly of close kinship, and usually under the eye of at least one medical or lay observer whose observation encompasses the whole group. It might be supposed, then, that we would have unusually full knowledge and exact records of intra-familial concentration of infectious diseases. And it is true that much of what we know about the communicability of certain diseases, and the special conditions related to exposure, susceptibility, and immunity is derived from observation on their spread—or failure to spread—in attacked families. It is also true that it has long been customary, even in rudimentary discussions of the epidemiology of communicable diseases, to give some account of the frequency and sequence of multiple cases within the family. But notwithstanding the tremendous mass of observations and literature bearing upon the concentra-

tion of communicable diseases within the household, our knowledge of the subject is still, for the most part, diffuse and unorganized.

This is due partly, perhaps chiefly, to the fact that the observations which have been reported have been presented in a variety of different forms, usually incomplete, and not readily convertible to a common basis. For instance, one observer will report the number or proportion of families in which more than 1 case occurred, while another will report the proportion of all cases in the community which occurred in families with more than 1 case. Both of these forms of statement are obviously incomplete, and neither is convertible into the other. A better, though less common, form of statement is the number of families having 1, 2, 3, . . . etc. cases; but this is of limited significance unless the material is further classified to show the distribution of families by size, and the presentation then becomes cumbrous.

Such systematic knowledge of the subject as we have today we owe largely to Dr. Charles V. Chapin, to whom we are indebted not only for furnishing the most extensive data as yet available on three communicable diseases—scarlet fever, diphtheria, and measles—but even more for having de-

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

veloped and introduced the simplest, most direct, most widely applicable and useful method so far devised for assembling the essential facts. The development of this method is only a detail in Dr. Chapin's classic studies of the epidemiology of communicable diseases; but it is a detail which is so intimately related to the whole plan and purpose of his work, and has been so widely useful, that it has seemed to me of interest to follow his approach to this particular way of summarizing experience.

The method which Dr. Chapin used for quantitative description of familial aggregation, a method which, so far as I have been able to ascertain, was introduced by him,* is the so-called "secondary attack rate"; that is, the attack rate, within a specified time, in members of attacked families exclusive of the "primary" case, time being reckoned from the onset of this case. The method itself is familiar; but before discussing its history it may be appropriate to call attention to its special merits—simplicity, and adaptability to a variety of uses.

The facts required are simple. They are, essentially: the date of onset of the first case in each family; enumeration of the other persons present in the household at the time; and record of the dates of onset of such additional cases as occur among them within a specified time from onset (or recognition) of the first case. It is useful and customary to add further facts about the primary cases, their household associates, and the cases among them, in order that the secondary attack rate may be related to such circumstances as the character and man-

agement of the first case, the sex, age, and previous history of others in the household, various details of their habits, movements and environment, and perhaps their kinship to the primary case. In addition to being simple and readily obtainable with fair accuracy, these facts are all of the kind essential for guidance of administrative authorities in their management of cases of communicable diseases.

Given the essential facts, their compilation for derivation of secondary attack rates is equally simple. It is necessary only to set up an array of the exposed persons, that is, in each family, all those present exclusive of the primary case, classified by sex, age, or other conditions which it is desired to take into account; to set up parallel arrays of the cases occurring in each group within specified time limits dating from onset of the first case in each family; and to calculate the secondary attack rate as a simple ratio between cases and exposed persons in each class. It is, of course, necessary, in any particular study, to adopt certain definite rules which may have to be more or less arbitrary, or to follow established conventions, in such matters as the definition of a "primary" case, the period of time for which the secondary attack rate is to be calculated, etc. These, however, are merely the elaboration in detail of what is essentially an altogether simple procedure; and the same may be said of the devices which must be employed in application of the method to chronic diseases or to frequently recurring infections such as the common cold.

The secondary attack rate has the further merit that it yields information in terms which are simple and directly related to the practical problems of the health officer. The question or series of questions which it answers directly is: given a case of communicable disease in the family, what is the

* It is of course impossible to be certain that this method had not been used and presented in some earlier publication; but the evidence available to me indicates pretty clearly that Dr. Chapin devised the procedure to meet his own needs, and it is certain that its general use in this country derives from his work.

risk of attack borne by others in the same household within specified periods of time, and how does this risk vary with the character and management of the original case and with the sex, age, past history, and various other circumstances of those exposed? It is upon the answer to these questions that the health officer must base his decisions as to the kind and duration of protective and restrictive measures which are required for the protection of the family and the public.

In addition to its quite obvious usefulness in giving a direct answer to practical questions of this kind, the secondary attack rate has broader significance in contributing to better understanding of the natural history of communicable diseases, especially the directly transmitted endemic infections for which the human host is obligatory. For such diseases the secondary attack rate gives the best approximation we have to the limits of incidence of the clinically recognized disease—or equally of the sub-clinical infection where it can be independently observed—in a group subjected to almost certain physical exposure to the infective agent. More extended knowledge of these limits is of fundamental importance, not only for comparison of one disease with another, but equally for comparing the manifestations of the same disease in different areas and different periods of time.

It is also of interest to ascertain the ratio of the secondary familial attack rate to the currently prevailing attack rate of the same disease in the general population; and this is readily done because the two rates may readily be reduced to the same time basis and are otherwise directly comparable. The interpretation of this ratio is not simple, but it clearly is an index of the focalization of disease or infection around the recognized clinical case, and has interesting if somewhat elusive im-

plications with respect to the relative frequency of clinically manifest cases of the disease as compared with concealed carriers of infection at large in the community.

Those who have found the secondary attack rate ready-made, having become familiar with the procedure before they have encountered the problems to which it applies, are apt to think that because it is so simple and direct it must have suggested itself immediately in the study of infection in families. But in epidemiology, as in other fields, the procedures which are at the same time simplest and most efficient are not often the ones which suggest themselves first. The direct approach to any problem is only one of many possible approaches, most of which are indirect; and there is an adage which reminds us that the appropriate method is most likely to be invented when it is needed to achieve a definite result. This appears to be the history of Dr. Chapin's development of this particular method. So far as may be judged from the methods which he actually used in assembling his data, it appears that he first used this particular form of statement when his investigations had raised a quite definite and specific question which could be answered only in terms of the secondary attack rate.

The record from which this is inferred, fortunately an unusually full record, and the only one to which I shall refer, is the series of annual reports rendered by Dr. Chapin as Superintendent of Health of the City of Providence, R. I., beginning with the first year of his incumbency, 1884, and followed through 1905, beyond which, for present purposes, it is not necessary to go. In these reports Dr. Chapin gives and discusses, year by year, a series of tables presenting his observations on various aspects of the epidemiology of scarlet fever and

diphtheria. These, taken in sequence, give an objective record of the specific problems taken up and of the data and methods used in attacking them.

In the first paragraph of the first report of the series, for the year 1884, following a comment to the effect that health departments probably are devoting too large a share of their attention to the abatement of nuisances, Dr. Chapin expresses the belief that "there is no doubt that more attention might well be given to the prevention of the more common infectious diseases and more time devoted to their scientific investigation," and following this, he notes the need of a medical inspector for this purpose. The report for the next year announces the appointment of Dr. Gardner T. Swarts as Medical Inspector, and among his duties, listed in detail, specifies:

To visit every case of contagious disease which is reported to this office . . .

To obtain as much information in regard to the cause of the disease as possible and to keep a record of all cases on blanks which, when returned to this office, are there kept on file.

It is of interest that the report of the Medical Inspector for this year gives the following somewhat unusual table, which includes in one group cases of scarlet fever, diphtheria and typhoid fever:

Whole number of cases reported	387
Number of premises inspected	321
Extra number of cases on same premises	66

Beyond the suggestion which this table gives of a special interest in the spread of contagious disease within the family, there is little in the first three reports to indicate the particular lines of investigation to be pursued. These are revealed, however, in the report for 1887. Here Dr. Chapin mentions that he has "collected some facts in regard to cases of scarlet fever occurring during the latter part of last year,

which, perhaps, are not of much value in themselves but may be when the number of cases can be increased." This marks the beginning of systematic tabulations of certain facts about scarlet fever, continued in substantially the same form for more than 20 years, adding to the numbers each year. Dr. Chapin's discussion, in the 1887 report, of the data on scarlet fever collected that year, indicates pretty clearly the kind of facts collected and the specific questions which they were intended to answer. These, however, are indicated as clearly and somewhat more succinctly in the table given below which first appeared in the report for 1888 and was continued thereafter for many years in nearly the same form. For convenience of reference the table as reproduced here is divided into 5 numbered sections. There is no such subdivision in the original, but in all other respects the table is precisely as shown here.

Each section of the table states by implication at least one definite question having reference to the frequency of the extension of scarlet fever to other members of the same family, or to other families in the same dwelling. Excepting the last question, which refers to frequency of attack in (susceptible) *individuals* following return to their homes, the most direct answers which the data give to the questions are in terms of the proportion of *families* in which the extension occurs. The secondary attack rate in "susceptible children" (without further differentiation by age) may be derived very easily from the data given in section (1) of the table and would probably yield the most satisfactory answer to the general question there indicated. I think it will be granted, however, that given sufficiently extensive observation—which Dr. Chapin subsequently accumulated—all the specific questions proposed in the table

SUMMARY OF OBSERVATIONS ON SCARLET FEVER

*From the**Sixth Annual Report of the Superintendent of Health of the City of Providence for the Year Ending December 31, 1888*

(The table as printed is not divided into the numbered sections shown here.)

	1887	1888	Total
<i>1</i>			
Number of families in which there was more than one susceptible child	232	244	476
Number of these in which there was no second case	102	97	199
Number of susceptible children in all the above families	986	827	1,813
Number of these children who were attacked	452	511	963
<i>2</i>			
Number of additional families with susceptible children in the same house where the disease appeared	112	128	240
Number of susceptible children in these families	381	354	735
Number of these additional families attacked	27	16	43
Number of children in these families attacked	58	21	79
<i>3</i>			
Number of families where inunction was practiced	87	99	186
Number of instances in the above families where the disease was not confined to one case	44	64	108
Number of susceptible children in these families	218	496	714
Number of these children who were attacked	148	319	467
<i>4</i>			
Number of tenements which were fumigated	51	63	114
Number of instances where fumigation was done, and where the disease spread to other families in the house	5	5	10
<i>5</i>			
Number of instances where susceptible children were at once removed	24	18	42
Number of instances where they were attacked on their return	3	1	4

A susceptible child is defined as "one who has not had the disease"; and a footnote to the table explains that "two months is allowed to elapse before the family account is considered closed."

may be answered satisfactorily by analyses in the forms indicated. Use of the secondary attack rate would have been preferable in some of the analyses; but in none is it obligatory.

The same report, for 1888, gives, for the first time, in incomplete form, a table which, in various more complete forms, is continued thereafter for many years. It refers to attacked families, and shows, by single years of age, up to and including age 20 (all above this age being grouped together as adults):

(1) "Number exposed," *i.e.*, the whole number of persons of indicated age present in the families, including both primary and secondary cases

(2) "Number of cases," without distinction between primary and secondary

(3) "Ratio of cases to number exposed," expressed as a percentage

Inclusion of the primary cases among the number of "exposed" is unfortunate.* It makes the ratio of cases to people "exposed" exceedingly difficult to interpret, and in fact Dr. Chapin himself appears at times to

* The persons first attacked in their families have of course been "exposed" to the specific infection of scarlet fever; but, having come into the table *because* of having scarlet fever, they are not exposed to the risk of contracting it within the time to which the table refers. The failure to distinguish between these two meanings of "exposure" makes the table confusing.

have misinterpreted it. Nevertheless, this form of tabulation has a definite and useful place in the sequence leading to subsequent use of the secondary attack rate. It requires only dissection of the basic data to yield secondary attack rates; and, as it stands, it gives useful information as to age distribution.

Beginning in 1889, the reports include tabulations for diphtheria equivalent to those which have been mentioned for scarlet fever; and from 1896 separate tables are given for diphtheria in families where the diagnosis was bacteriologically confirmed.

In 1903 an important addition is made to the series, namely, a table relating to scarlet fever and a similar one for diphtheria, showing, for a considerable period of years, the number of secondary cases distributed according to time of onset in days from onset of the primary case in the family. The age distribution of secondary cases is not given in these tables.

It is in the report for 1903 that Dr. Chapin first makes use of the secondary attack rate. Since 1891 an increasing proportion of cases of diphtheria and scarlet fever had been removed each year to the hospital for contagious diseases; and the question which brings in the use of the secondary attack rate is that of the resultant benefit to other members of the families from which the primary cases had been removed. Referring first to diphtheria, Dr. Chapin gives a table showing, by age, the number of persons left at home in the families from which primary cases were removed to the hospital. Among the 1,420 persons included in this group, 55 were attacked subsequent to removal of the primary case. The specific question asked is: how many cases of diphtheria might have been expected in these 1,420 people if the primary cases had remained at home? This, as he notes, requires the calculation of age-specific secondary attack rates—i.e., attack rates in members of the family *exclusive* of the primary case—in families where the primary case remained at home. No table was available giving the full data required for calculating these rates, namely, (1) the age distribution of persons in attacked families *exclusive* of the primary cases, and (2) secondary cases at each age. However, a table (A), which has been mentioned heretofore, gives the aggregate number of secondary cases (1896–1903), not separated by age; and another (B) gives, in attacked families, the number of cases, and the ratio of cases to people. Referring to these two tables, Dr. Chapin observes that the secondary cases constitute about 40 per cent of all that occur, hence he takes 40 per cent of the ratios shown in table (B) as representing approximately the secondary attack rates. Applying these rates to the corresponding age groups of the population left at home, and making an ingenious adjustment for the varying intervals from onset of the primary case to removal from home, he estimates that had these patients remained at home their familial contacts might have been expected to suffer an incidence of about 120 cases instead of the 55 actually recorded. The same method is then applied in estimating the "expected" as contrasted with the observed incidence of diphtheria in well persons who removed from their homes subsequent to the onset of the primary cases; and similar estimates are made with respect to scarlet fever.

Two years later, in the report for 1905, appears the first table giving age-specific secondary attack rates for males, females, and both sexes combined. It refers to diphtheria, including only families for which the diagnosis was bacteriologically confirmed, and includes data for the full

decade 1896-1905. As the table is given here it is necessary to refer to another table for some basic data used in calculating the rates, but with this reference it is complete. Later, the form and arrangement of the table were altered at various times, bringing the data together in more convenient form. Beginning in 1908, tables are added showing secondary attack rates in scarlet fever; and in various subsequent reports special tables are given showing separately the secondary attack rates in families where the patient lived (that is, recovered) and remained at home; in families where the primary case was removed to a hospital, and in families employing servants or nurses. In general, these tables refer back to dates considerably earlier than the dates of the reports in which they first

appear, and the figures given are large.

This review has followed only one particular line of Dr. Chapin's studies, the one which led to use of the secondary familial attack rate. No attempt has been made to follow through the many other lines along which his investigations of scarlet fever and diphtheria extended; and space does not permit even their enumeration here. Most of the specific questions investigated did not require use of the secondary attack rate and had already been answered by other methods and in other terms before this form of statement had been adopted. When a specific question eventually arose definitely requiring this method, the essential data had already been provided, and the method itself cannot have been far below the surface.

National Foundation for Infantile Paralysis

FOLLOWING his recent announcement of the establishment of the National Foundation for Infantile Paralysis, President Roosevelt has issued a statement of the appointment of 34 citizens of various parts of the United States to serve as trustees.

It is hoped that a fund of from 7 to 10 million dollars will be raised in the next 5 years, with which the Foundation "will make every effort to ensure that every responsible research agency in this country is adequately financed to carry on investigations into the cause

of infantile paralysis and the methods by which it may be prevented. . . ." It also aims to develop means of enabling those already crippled by poliomyelitis to become economically independent in their own communities.

All funds collected through the celebration of the 5th annual "birthday ball," held January 29, 1938, in honor of the President's birthday January 30, will be given to the new Foundation, instead of being divided as heretofore between the Georgia Warm Springs Foundation and local communities.

A State Cancer Program^{*}

HENRY D. CHADWICK, M.D., F.A.P.H.A., AND
HERBERT L. LOMBARD, M.D., F.A.P.H.A.

*Commissioner of Public Health; and Director of Adult Hygiene,
State Department of Public Health, Boston, Mass.*

AN Act establishing the first permanent state board of health in the United States was signed in Massachusetts on June 21, 1869. The keynote of the fullest interpretation of the term "public health" was inherent in this first beginning and the beginnings from which it, in turn, sprang. This law mentioned the 4 important activities of health departments: (1) vital statistics, (2) communicable disease control, (3) epidemiology, (4) sanitation. The first chairman of the board, Dr. Henry I. Bowditch, began his first report¹ with his comprehensive concept of public health. In part he said:

No board of health, if it rightly perform its duty, can separate the physical from the moral and intellectual natures of man. These three qualities of man are really indissoluble, and mutually act and react upon each other. Any influence exerted to the injury of one, inevitably, though perhaps very indirectly, injures another. As in the physical world there is a correlation of forces, so that no force is ever lost, but only interchanged with another, so do these various powers and qualities of man act upon each other, and act and are acted on by the physical forces of nature that surround him.

By the careful and comprehensive study of these various laws and of their relations, the highest department of the physician's art is brought into operation. But no man or private body of men has the ability to study and to develop this department as a free commonwealth can do when acting through the agency of a few persons who are devoted to this object, and who come willingly to

the work, and armed with the power and the ample means of the state. Hence the term "State Medicine," though criticised by some, becomes a most appropriate and terse expression of the position which our Commonwealth has now assumed. . . . The State Board of Health . . . will adopt the fine old maxim, pagan though it be, that nothing which pertains to humanity, in its widest sense, will this board deem foreign to its aims.

This seemingly visionary prediction has been realized in the increased responsibilities which the Legislature has placed upon official public health.

Cancer was first mentioned officially by the Massachusetts Health Department in the annual report in 1896. A legislative decision to have the situation studied statistically resulted in 1900 in Whitney's classic report on cancer statistics.²

The only other official act of the Health Department until the inception of the program in 1925 (aside from yearly statistical mention and an occasional lecture) was the establishment of a tumor diagnostic service in 1919.

Independent groups led by physicians, clergymen, and others, began to take action, first in one part of the state and then in another, seeking assistance for the local cancer problem. Eventually, these several independent currents of interest blended into one broad common channel, and by 1921 the state-wide coöperation of a majority of the medical profession, together with the interested clergymen and lay-

^{*} Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

men, unique as far as can be ascertained, manifested itself: first, by stimulating an intensive study of the whole state cancer situation, with all its multiple variables and, second, by sweeping into law a program comprising the five salient recommendations of the study.

Thus, the cancer program came into existence with state-wide acclaim and enthusiasm. The real secret of its persistent popularity probably lies in the feeling on the part of so many individuals that they had a hand in its inception. It should be mentioned that some physicians, including the Commissioner of Health at that time, questioned its place in a health department. Their opinions were recorded, but were overruled by popular sentiment.

The early years of the cancer program witnessed the opening of the state cancer hospital at Pondville, the organization of 12 cancer clinics in the several parts of the state, educational work of a general type, and statistical research. At the beginning of any program, constant appraisal and revision is necessary before the most satisfactory working plan is evolved. After 8 years of operation under the original schedule, in 1934 the Commissioner met with an interested group and discussed a reorganization of the whole cancer program. The revised plan has been in effect for 3 years, and the results justify a belief in its effectiveness.

It is significant that the introduction of this program focused the attention of the department for the first time on chronic disease. This, however, was a logical development of health service. The great reduction in the morbidity and mortality from gastrointestinal diseases of infancy and childhood and the acute communicable diseases, and the aging of the population, have placed chronic disease in the forefront, taking

its toll of two-thirds of total deaths from all causes in Massachusetts. A department of public health must keep in step with these fundamental changes and readjust its activities to meet the problems incidental to an older population.

A state health department has the organization to bring together all the factors and factions that should be engaged in a cancer program to the end that continuity of effort and coöperation of patient, physician, and health official may be assured, and the resources of the state made available to wage a campaign against a disease that in Massachusetts is causing one-eighth of all deaths at the present time. As a cause of death, cancer has but one superior—the cardiovascular group.

The cancer program in Massachusetts has 5 main features:

1. A tumor diagnostic service
2. A state hospital for the treatment of cancer
3. Diagnostic clinics
4. Education of physicians and the laity regarding cancer
5. Statistical research for the evaluation of the problem.

TUMOR DIAGNOSTIC SERVICE

A tumor diagnostic service is maintained by the department in conjunction with the Harvard Cancer Commission. Any physician or hospital may have suspected tissue examined to determine the presence or absence of cancer.

STATE HOSPITAL FOR THE TREATMENT OF CANCER

The Pondville Hospital, with 145 beds, is maintained by the Commonwealth exclusively for the treatment of cancer. A new ward of 50 beds is nearly ready for occupancy at the Westfield State Sanatorium in the western part of the state. Patients with cancer or suspected cancer of all

types and stages may be admitted to these hospitals provided they have been in Massachusetts for 2 of the preceding 3 years and are certified for admission by licensed physicians. The charges for individuals able to pay are \$10.50 per week; all others are hospitalized at no expense to themselves. Hospital charges to cities and towns for patients unable to pay their own fees are \$2.50 per day. No additional charge is made for service or treatment. Diagnostic services are free in the out-patient clinic, while the charge for treatment is \$1.50. Diagnostic, surgical, therapeutic, radium, X-ray (diagnosis and treatment), medical, and nursing services are available. An out-patient clinic for diagnosis and treatment is held on Thursday afternoon for new patients at 1 p.m. and old patients at 2 p.m.

From the inception of the plan for hospital treatment, it was recognized that great care would have to be exercised to prevent the institution from becoming known as a "Death House" or a home for terminal cases. To avoid this it was decided that only patients would be received for treatment of conditions that were susceptible of relief or in which there was a hope of cure. No patients were excluded if their sufferings could be mitigated by any form of treatment or whose lives could be prolonged by operation or radiation.

The stay in the hospital was strictly limited to the time necessary to carry out the treatment, and then the patient was discharged to his home or to another institution. This wise policy has resulted in keeping the period of hospitalization to a minimum and making the beds available to as many patients as possible. The average stay for each patient is approximately 36 days and, therefore, each bed is made to serve 10 patients per year.

When patients are discharged they are instructed to return to their physi-

cian for follow-up, or if they have no physician, to return to the out-patient department of one of the state-aided cancer clinics at regular intervals. A well developed social service keeps in touch with the patient or physician to see that recommendations made by the hospital staff are carried out. The plan entails reports as to the patient's condition as long as he lives, and complete records of progress are kept at the hospital. Periodically, the members of the staff summarize the cases of different types of cancer and evaluate the results of treatment. By this follow-up system, the patient is kept under constant supervision and, if it is necessary, may be returned to the hospital for further treatment without delay. The judicious use of radiation and alleviatory operations has lessened the sufferings of a large number of patients thought to be incurable, and many of them have been able to return to their homes to carry on some of their daily duties.

At the beginning of the cancer program, the department and many physicians were apprehensive that the cancer cases that went to the state hospital would simply lower the attendance elsewhere. This has been proved to be a groundless fear. In 1935 the state cancer hospital admitted 1,186 cases. In the same year, 81 other hospitals, comprising about three-fourths of the total hospital beds in the state, admitted 5,488 cases. These same hospitals in 1925 admitted 3,585 cases. The actual number of cancer deaths increased in the period of 10 years by 25 per cent, but the hospital admissions for cancer, including the state cancer hospital, by 86 per cent. Apparently, the intensive cancer program has increased the attendance at the hospitals.

DIAGNOSTIC CLINICS

A method for providing adequate medical care by augmenting the re-

sources of the individual physician, rather than by supplanting the physician himself, has been tried in the Massachusetts Cancer Program. The cost of X-ray, radium, metabolism tests, cardiograms, and certain laboratory procedures is far in excess of the ability of the man of low income to pay. By furnishing such diagnostic procedures when needed, a form of socialized medicine is introduced which benefits both the physician and his patient and obviates more drastic change. It has been stated that every individual should not have medical care and treatment because every individual cannot afford it, but who is to determine which man's life is to be saved and which lost because of lack of money which, in itself, is often the result of an economic system over which the individual has no control.

In the Massachusetts Cancer Program the state furnishes a hospital and 20 clinics. Every physician in the Commonwealth may bring or send his patient to one of these clinics for free consultative service. If the case requires such a diagnostic procedure as extensive X-ray, this will be paid for by the patient if he is able and by funds available for this service if he is not. Each patient is referred to the physician who sent him to the clinic and the physician decides whether or not he desires further assistance in securing treatment for his patient. If he does, the state cancer hospital and the social service staff are at his disposal.

These 20 clinics are located strategically so that no person requiring an examination need travel more than 25 miles from home, at the most, to obtain it. These clinics are solely for diagnosis. The cancer clinics are administered by committees appointed by local medical organizations, which have charge of the administrative details connected with their respective clinics,

but in all cases they must conform with the minimum standards set by the department. These are:

1. Group diagnosis—The group must consist of at least 3 men, preferably surgeon, pathologist, and radiologist. When any of these are not available, other physicians may be substituted.

2. Uniform records—Forms are furnished by the department for this purpose as is also money for clerical service when needed.

3. Social service—All cases of cancer and precancer are referred to social service for follow-up. The follow-up continues until death in the case of cancer and until removal of the lesion in the case of precancer. The state either furnishes money to help defray the expenses of the social worker or furnishes the clinic the services of a part-time social worker.

The clinics must meet at least twice a month. At intervals determined by the clinic committee, but in no instance less than 4 times a year, some form of teaching for the physician in the community is required. Most clinics perform this service by having consultants come to the clinics at stated intervals, while others conduct teaching clinics by members of their own staff.

The clinic itself is furnished the following services by the state: (1) advice, information, and literature; (2) funds for or services of social worker; (3) funds for travel of social worker; (4) funds for X-ray diagnosis for those unable to pay; (5) funds for teaching clinics; (6) funds for clerical assistance in clinics; (7) funds for postage, telephone, stationery, etc.; (8) special clinics for the staffs of the clinics; (9) reference of cancer cases to Pondville through social service.

The purpose of the clinics is to furnish physicians and the public, group consultation service in cancer, as well as to improve the knowledge of cancer among the medical profession and the laity. The group furnishes a diagnosis and outlines a plan of treatment for any person suspected of having cancer, regardless of financial status. Every

effort is made to have the family physician either come with his patient to the clinic or send the patient with such information as he cares to furnish. Any individual is admitted to the clinic, although it is preferred to have the patients referred by physicians so that any tendency to use the cancer clinic in order to establish a diagnosis of a condition originally not suspected of being cancer may be eliminated.

As the success of treatment is largely dependent on early diagnosis, that phase of the program is stressed in all the educational activities directed toward the profession or the public.

That the present type of clinic organization is meeting with coöperation from the physicians is attested by the fact that in the first 2 years of the clinics physicians sent 51.4 per cent of all cancer patients to the clinics and in the last 2 years (8 years later) 77.3 per cent. The percentage of cancer patients coming to the clinics on their own account, that consulted a physician but were not advised by him to go to one of the clinics, decreased from 33.9 per cent to 11.6 per cent, while the percentage that consulted no physician has dropped from 14.7 to 8.3.

The cancer patients who come to the clinics on their own volition come earlier than formerly. In the first period they waited 12.3 months, in the last period 8.6 months, which shows that education through newspapers, radio, etc., has accomplished something, but the 8.6 months' delay in the last 2 years is considerably greater than the 6.9 months' delay of patients who consulted physicians before coming to the clinics.

By due consideration of these various factors, it would appear that the improvement found in cancer clinics is about 80 per cent due to the physicians' efforts, and 20 per cent to an improved public consciousness of the

disease. Although not satisfactory, this is far better than the reverse, for even if the public did not present itself at the cancer clinics until after the disease had been progressing for several months, it could be assured of much better treatment by the profession than it would have received 10 years ago.

RESEARCH

The studies have covered the volume of the problem; the existing hospital facilities in the state including the availability of radium and X-ray; the medical, social, and economic aspects of the disease; as well as such etiological findings as would be obtained by statistical analysis of death records, hospital records, and home visits to cancer patients. This work is continuing and reports are made on new evidence as it is acquired.

EDUCATION

The field of health education is at present in an elementary stage. For 30 years personal hygiene has been the subject of much popular discussion. On the whole, this has been based on fads and hearsay rather than on the results of scientific research. There are several experiments being conducted at present attempting to find a solution to this problem of disseminating knowledge. Scientific medicine is years ahead of its popular application. The problem is to present it in such a way that the individual will act upon the knowledge he receives. The backwardness in applying knowledge may be the result of an unfortunate tendency to talk generalities on the assumption that real knowledge is over the heads of the general public. If a disease and the present state of knowledge concerning it are explained in a clear way, the public responds with understanding and intelligence.

The reception of the Coöperative

Cancer Control Program in Massachusetts is the best and most recent example of this. If exact knowledge were discussed about cancer and the specific resources available were made known, the present percentage of cures would be nearly tripled in this state of more than 350 communities with a population of nearly 4,500,000, and over 7,000 physicians. Each town and city in the Commonwealth has been or is being organized into a small Coöperative Cancer Control Committee for the dissemination of this exact knowledge. Already 220 Coöperative Cancer Control Committees have been organized with results beyond any expectations. Every club, or even every small group of individuals which meets regularly, is asked to have a meeting on cancer once a year. The local physician is asked to meet with this group and discuss cancer and answer questions. This is the crux of the whole plan. At these small group meetings the public is informed of the relationship of chronic irritation to cancer, of the percentage of cures of the disease, of the fallacy of the cancer folklore, and the danger of the cancer quack. All physicians are participating in this program by giving these talks and answering questions. By teaching in this way, many practitioners are acquiring a better personal knowledge.

Another reason for the success of this plan is that it includes every group in the Commonwealth. The social, fraternal, racial, religious, military, political, and service groups are all represented. This is more than a cross-section. It is the whole population of the state. The influx of patients to physician and clinic following meetings of this sort shows that the information is being not only disseminated but acted upon.

The results of this method of education are already apparent. In 1936

the interval of delay between the first recognizable symptoms of cancer and first consultation with a physician showed, in Massachusetts, a decrease of nearly 20 per cent. For 9 years prior to this, the interval had remained practically stationary.

If the 12 months of 1937 show the same tendency that the first 6 months have shown, this period of delay will be even less. There has been a big increase in attendance of cancer patients at 2 non-state-aided cancer clinics in Boston in 1937 which the authorities attribute, in both cases, directly to the state educational program.

In 1934 Bigelow and Lombard³ published a paper showing that the cancer death rate increased for both sexes between 1900 and 1920, and that following 1920 there was no increase among females when allowances had been made for the changing age composition of the population. The table shown in this paper has been continued to include 1936. The years 1935 and 1936 showed a decline among females, with the rate in 1936 slightly lower than in 1935. The figure for the early part of 1937 points toward a continuation of this decline. This is particularly gratifying as it is another confirmation that the new program inaugurated in 1934 is producing tangible results. The male rate also may be responding to the program, although the evidence is not sufficiently marked to warrant any conclusions. Females have a greater number of accessible cancers and any improvement would be expected to show first in this group.

The effectiveness of the new cancer program is again demonstrated in the change in age at time of death. At the beginning of the program this was 63.3 years. In 1934 it had not improved, but in 1936 this figure had risen to 64.6 years. This indicates that lives are being prolonged as well as saved.

TABLE I

*Massachusetts Age, Sex Adjusted Cancer
Death Rates**Adjusted to Massachusetts 1900 Population
Rate per 100,000*

<i>Year</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
1900	50.2	91.6	71.5
1901	50.6	93.7	72.7
1902	47.9	97.0	73.0
1903	50.9	97.8	75.0
1904	54.2	102.9	79.2
1905	55.5	103.7	80.3
1906	63.1	99.5	81.8
1907	58.9	108.7	84.4
1908	59.9	108.7	84.9
1909	60.3	108.5	85.0
1910	63.7	111.3	88.1
1911	68.8	112.1	91.0
1912	63.5	117.6	91.3
1913	71.5	119.7	96.2
1914	70.9	119.6	95.9
1915	73.7	119.5	97.2
1916	77.1	126.5	102.5
1917	76.2	127.0	102.3
1918	78.6	123.2	101.5
1919	77.9	120.5	99.7
1920	84.5	128.6	107.1
1921	85.9	129.4	108.2
1922	83.5	126.9	105.8
1923	85.4	125.8	106.1
1924	92.2	127.5	110.3
1925	89.6	130.0	110.4
1926	94.3	127.5	111.4
1927	92.5	128.9	111.1
1928	94.3	128.8	112.0
1929	93.3	127.4	110.8
1930	96.8	125.4	111.5
1931	93.5	126.2	110.3
1932	96.7	129.2	113.4
1933	101.5	128.7	115.5
1934	107.2	129.4	118.6
1935	99.2	125.2	112.5
1936	105.9	124.9	115.7

The physician is the key man in the Massachusetts Cancer Program. The whole program revolves around him, and both he and his patients are helped. In this way, his traditional position is unimpaired and the close relationship continues to exist between patient and physician. The majority of citizens in this country prefer to retain their own family physicians. On the other hand, they need services oftentimes involving expensive procedures beyond their reach financially. Any plan, to be successful, must try to meet the needs of these countless thousands for adequate medical care. The method to be adopted will have to be planned to make the burden on the taxpayer as light as possible. The Massachusetts Cancer Program is enthusiastically supported by both physicians and the public and for this one disease is meeting the needs of the people as they have never been met before.

REFERENCES

1. *First Annual Report of the State Board of Health of Massachusetts*, January, 1870. Wright & Potter, State Printers, Boston, 1870.
2. Whitney, W. F. *Statistics of Cancer in Massachusetts. Thirty-Second Annual Report of the State Board of Health of Massachusetts*, pp. 751-753. Wright & Potter, State Printers, Boston, 1901.
3. Bigelow, George H., and Lombard, Herbert L. Change in the Massachusetts Cancer Trend. *New Eng. J. Med.*, 210, 10:526-529 (Mar. 8), 1934.

Diabetes—An Important Public Health Problem*

CHARLES F. BOLDUAN, M.D., F.A.P.H.A.

Department of Health, New York, N. Y.

BECAUSE of the marked decline in the birth rate, due to birth control and to the cessation of overseas immigration, there has been a steady aging of our population. This has brought with it an increasing mortality of diseases associated with the higher ages, such as chronic disease of the heart, arteries and kidneys, cancer and diabetes.

As health administrators, we naturally study these conditions in the hope that we may find some means of preventing them, or failing which some means of prolonging life.

The work of Allen on the treatment of diabetes and especially the discovery of insulin by Banting and Best, in 1921, attracted wide attention to diabetes as a disease in which life could undoubtedly be greatly prolonged. But even then, health administrators appear not to have regarded diabetes as a condition toward whose control they should provide in their health program. Here and there writers called attention to the steady rise in the death rate of diabetes, and the suggestion was repeatedly made that it was the result of the rapidly increasing consumption of sugar.

In 1929 I began to devote special attention to the statistics of diabetes, and urged consideration of this disease

as a public health problem. At first I too accepted the available statistics at their face value, but further study showed that this was misleading. I believe it will be helpful to review briefly the data which recent years have made available.

Because of the relatively uniform classification of New York City's mortality statistics over a long time, and because of the large population from which these statistics are drawn, I shall confine the discussion largely to conditions in New York City.

Taking the figures at their face value we appear to have a picture of diabetes mortality in New York City as shown in Table I.

Two features of this table deserve attention. First, note the rise in the death rate, from 2 per 100,000 in 1871-1875 to 30 in 1931-1935. Inasmuch as we know that prior to the introduction of insulin the case fatality of diabetes was high, the low mortality rates recorded in the earlier years would *seem* to indicate a very low prevalence of diabetes in New York City. The second point is the much greater rise in the mortality rate among females. During the earlier years, up to about 1900, the rates are approximately the same in the two sexes. Since then the diabetes mortality rate in females has risen much more rapidly than that in males, so that now it is more than double the male rate.

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

TABLE I
Diabetes Deaths Reported, New York City, 1871-1935 Inclusive
Average Deaths per Year *Rate per 100,000 Population*

	<i>Average Deaths per Year</i>			<i>Rate per 100,000 Population</i>		
	<i>Total</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
1871-1875	21	13	8	2	3	2
1876-1880	35	20	15	3	4	3
1881-1885	58	34	24	4	5	4
1886-1890	110	60	50	7	8	6
1891-1895	152	78	74	9	9	8
1898-1900	334	156	178	9	9	10
1901-1905	520	242	278	14	13	15
1906-1910	690	286	404	15	13	18
1911-1915	916	383	533	18	15	21
1916-1920	1,063	429	634	19	16	23
1921-1925	1,284	486	797	21	16	26
1926-1930	1,624	552	1,072	24	16	32
1931-1935	2,140	712	1,428	30	20	40

Why the rise in the mortality charged to diabetes? Why the approximately equal rates up to about 1900? What factor could have entered at that time to bring about so marked an increase in the death rate among females?

These are not academic questions and satisfactory answers are necessary in order that we may deal intelligently with diabetes as a public health problem.

The low mortality rates of the early years *seem* to indicate that there was far less diabetes then than there is now. But—

Was diabetes a rare disease? All the older medical textbooks speak of it as such. I am certain that this view is incorrect and that diabetes was very much more prevalent than the medical profession realized. The diagnosis of diabetes depends on the detection of sugar in the urine. Prior to 1850 this detection was largely by finding that the urine had a sweet, honey-like taste. Do you wonder that one of the textbooks says that it is a rather disagreeable test to make! Shortly before 1850 the Trommer and the Fehling chemical tests were introduced and are mentioned in textbooks published in the 60's and 70's. My study of the medical histories of New York Hospital

shows that it was decades before these simple tests were routinely applied. If this was true of a first-class hospital, how frequently is it likely were tests of urine for sugar employed by private physicians? Even today how often is such an examination a regular routine for all cases? Let us start, then, by holding that diabetes was by no means a rare disease and that it was simply not diagnosed.

The sex distribution as shown in mortality statistics—All students of diabetes are agreed that diabetes is more prevalent among females than among males. Why do the earlier statistics show about equal mortality rates in the two sexes? A simple and wholly satisfactory answer to this is furnished by the manner in which a large proportion of the cases of diabetes were discovered during those earlier years, namely, purely by chance as the result of examinations for life insurance. Fifty or 60 years ago the proportion of women applying for life insurance was small. Hence, what cases of diabetes were detected through such insurance examinations were almost all among men. Even though diabetes was then, as now, more prevalent among females, its detection in those years was more likely among

males. Hence the nearly equal mortality rates in the sexes.

This view also affords a reasonable explanation for the mounting excess of the diabetes death rate among females during the past 30 or 40 years. Inquiries of a number of large life insurance companies revealed a marked increase in the proportion of applications for life insurance from females. Increases amounting to 20 per cent or more since 1900 were reported.

Increase in the diabetes mortality rate since 1900—Our mortality statistics indicate an increase in diabetes mortality in both sexes during the past 35 years. A very large proportion of this undoubtedly represents only a more frequent recognition of the disease, especially among females. Besides this, an increase now amounting to at least one-third over the 1900 rates is due to the aging of the population. In New York City, for example, the proportion of the "45 years and over" group is more than one-third greater than it was in 1900. This is the age group which has by far the greatest proportion of diabetics. In New York City another fact must be considered, namely, the increase in the proportion of Jews in the population during the past 40 years. Diabetes appears to be from 50 to 75 per cent more prevalent among Jews than among non-Jews. In New York City, therefore, the marked increase in the proportion of Jews has also been a factor in the rising mortality of diabetes.

It is certainly highly significant that when due allowance is made for the aging of the population and the increasing proportion of Jews, the diabetes mortality rate in New York City among males shows a downward trend during recent years. If the explanations here advanced for the rising death rate among females are correct, we may expect the increase in females to con-

tinue for some time until the rate becomes stabilized at a point which represents approximately the relative prevalence of diabetes in the sexes.

I have dwelt so much on these statistical aspects of diabetes because their appreciation is necessary in order to keep us from following false trails. I am convinced that those who explain what they regard as a marked rise in diabetes mortality, are attempting to explain something which is not a fact. Bear in mind that I admit a *real* increase in the prevalence of diabetes because of the aging population. Beyond this, however, the increase indicated by the registered mortality is fictitious.

A number of writers, who apparently regard most of the increase in the recorded death rate of diabetes as real, see an explanation in a decrease in physical labor because of labor-saving machinery, and an increase in the prevalence of obesity. Among the arguments advanced, mention is made of the lower diabetes mortality rates among rural and urban populations, it being pointed out that there is generally more physical labor among the rural dwellers and that their diabetes death rates are distinctly lower. I believe that the chief and perhaps the only reason for the lower diabetes rates in rural populations is the greater extent of the medical services in urban areas, and that it is again a question of recognition. I also consider it far-fetched to conclude, because *recorded* diabetes mortality rates are higher among farm owners than among farm laborers, that the difference is due to the lesser amount of physical labor among farm owners. Surely farm owners, as a group, enjoy much better medical service than do the farm laborers. Finally, what evidence is there that there has been an increase in the prevalence of obesity, a statement often

made as though it were an established fact? I have attempted to obtain information as to the prevalence of obesity a generation ago and now, by personal interviews with, and data secured from manufacturers of shirts and collars, large clothing manufacturers, and makers of women's clothing. All those interviewed had quite definite opinions that there had been no increase in the prevalence of obesity. Unfortunately, in no case was it possible to secure actual figures over a sufficiently long period to make comparisons. In this connection, bear in mind that the mortality statistics seem to indicate an increase in diabetes limited to women. What facts support the alleged increased prevalence of obesity in women? Have not just the past 20 or 30 years been characterized by the vogue of the slim, boyish figure? Were slimming treatments ever before so popular as during the past quarter century?

Most experienced clinicians agree that there is a relationship between obesity and the development of diabetes. From what I have said, however, it should be clear that an alleged but improbable increased prevalence of obesity cannot be advanced to explain the rise in diabetes mortality. In males, having in mind the aging population, there is, I believe, no increase to explain; in females, present rates one-third higher than in 1900, are satisfactorily accounted for by the aging population, and increases beyond this are much better explained by increased recognition of the disease in women.

Prevalence of diabetes—Inasmuch as diabetes is not a reportable disease, we have no ready means of determining its prevalence. This difficulty is increased by the fact that many cases are unrecognized. Thus, even in a city like New York, where medical facilities are abundant, a survey conducted a

few years ago by the Academy of Medicine, embracing 1,600 cases of diabetes in 24 large hospitals, disclosed that in over one-sixth of the cases the diagnosis of diabetes had not been made before admission of the patient to the hospital.

A survey of chronic illness conducted in Massachusetts several years ago indicated that there were some 15,000 diabetics in that state. Joslin states that in 97 per cent of these individuals the condition had been diagnosed by physicians. This very high percentage leads one to believe that the total number of diabetics was substantially larger than that calculated from the survey findings, for, as just mentioned, the disease often remains long unrecognized.

Examinations of the urine of a large random sample of the general population would give valuable information as to the prevalence of diabetes. To be of value one would require the sample to consist of a sufficiently large number, male and female, in each of the important age groups. Thus far, so far as I know no such survey has been made, for it is an enormous undertaking. I made an attempt along this line some years ago, securing information regarding the percentage of persons with definite glycosuria among the new admissions to state hospitals for mental disease. The data were obtained from these hospitals because I knew of no correlation between mental disease and diabetes. Data from general hospital services would necessarily have included individuals who were admitted because of a diabetic condition. My survey embraced a total of only 3,685 persons, a number too small to yield more than a suggestion as to the prevalence of diabetes in the city's population. The percentages obtained in this study indicated that in New York City there might be as many as 100,000 diabetics.

That this approximate figure may

not be far from the facts, appears from the studies made by the New York Diabetes Association. These indicated that in one year there were about 8,000 patients attending diabetes clinics, and over 7,000 patients treated, as bed patients, in hospitals. A questionnaire sent out by the Health Department to all the physicians in the city elicited replies from 4,000 physicians who, altogether, were caring for 8,000 private patients having diabetes. This ratio of 2 diabetics for 1 physician may not hold for all the 15,000 registered physicians, but the number of private diabetic patients must run into the thousands. Besides the patients thus estimated, there is a considerable number of diabetics who are entirely unaware of their disease and therefore not under treatment, and also some who are treating themselves with patent nostrums. There is reason to believe that the total number of diabetics in New York City is not far from 1 per cent of the population, and it is probably conservative to estimate the diabetics in the United States as over 600,000. In any event the number is so large that the condition deserves wide attention as an important health problem.

Causative factors—Priscilla White and her associates have brought forward considerable evidence that heredity is an important factor in diabetes. Joslin emphasizes the rôle of obesity in the development of the disease in those with a diabetic ancestry. Mosenthal feels that pregnancy is often an exciting factor in the development of diabetes, citing my New York City figures which show nearly treble the diabetes death rate among married and widowed women over 45 years of age than among single women of the same age. Recent investigations disclose the important part played by endocrine disturbances in the development of diabetes. With all this newer knowledge

medical science has not yet unraveled the ultimate cause of diabetes.

Despite this ignorance as to the cause of diabetes there is much that can and should be done in dealing with diabetes as a health problem, for experience has shown that with the aid of insulin the lives of diabetics can be greatly prolonged. Many diabetics are now enabled to live out a normal life span, and do this while attending to their daily affairs like normal, non-diabetic individuals. To achieve this for as large a number of diabetics as possible should be the goal of our efforts. How shall we bring this about?

A practicable program—While the health authorities may well take the lead, they will need to enlist the coöperation of the medical profession, the hospitals and clinics, and the welfare agencies. Inasmuch as New York City was the first to organize an attack on diabetes as a public health problem, let me give a brief sketch of our work.

In 1932, at the request of Dr. Shirley W. Wynne, at that time Commissioner of Health, the New York Academy of Medicine appointed a special committee to study the problem of diabetes and make recommendations for dealing with the situation. The report of this committee, presented by the chairman, Dr. H. O. Mosenthal as the Hermann M. Biggs Memorial lecture in 1933, suggested the formation of a committee or association with a paid secretary, suitable office facilities, and a modest budget for necessary expenses. The functions of the proposed organization were enumerated as follows:

To act as a clearing house for the study of diabetes as a health problem, and to devise measures for the control of this disease.

To assist in the formation of a committee of clinics dealing with diabetes.

To stimulate more effective coöperation between clinics and hospitals in the treatment of diabetes.

To develop more extensive and more continuous graduate courses of instruction for physicians.

To carry on health education of the public in all matters pertaining to diabetes.

To assist in the preparation of exhibit material which can be used in the instruction of diabetics attending clinics.

To attempt a solution of the problem of providing insulin to the indigent.

To study the needs of the various parts of the city to the end that adequate facilities for diagnosis and treatment may be generally available.

To extend our knowledge of diabetes by the interchange of views at suitable meetings.

To train groups of nurses, as so usefully done by Joslin, in the special nursing of diabetics.

In New York, thanks to financial support provided by Lucius N. Littauer, this program was put into effect by the organization of the New York Diabetes Association in 1934. The work has been very successful and has led several other cities to organize programs along similar lines.

Today, with the chronic diseases of later life steadily assuming greater importance as health problems, diabetes deserves special attention. In none of the other diseases in this category have we such certain prospects of success in helping the victims live out a normal life span.

Pneumonia Service in New York

JOHN L. Rice, M.D., Commissioner, reporting on the first week's activities of the New York City Health Department's pneumonia service, stated that 69 specimens had been typed and 665 vials of serum supplied.

Plans are now being perfected by the Department of Health in coöperation

with the Pneumonia Advisory Committee to conduct refresher courses for physicians in the serum treatment of pneumonia. Such courses will be conducted in hospitals in each of the boroughs. In the near future the days, hours and location of the courses will be announced to the medical profession.

Allocation of Deaths

A PAPER by Miss Elizabeth Parkhurst, senior statistician, State Department of Health, Albany, New York, U. S. A., printed in the *American Journal of Public Health* (July, 1937), raises afresh the question of the allocation of deaths of citizens outside the area of their residence. In Britain we have had for many years a fixed convention that every death, whatever its cause or nature, shall be accredited to the usual place of residence of the deceased, whatever may be the length of time which has elapsed since the deceased left his native town. Residence is the place where the deceased had his home and to which he would be expected to return should he return at all. This system has several disadvantages and some absurdities, but it has the immense advantage of being definite; so we all know where we are, even if we find ourselves in an uncomfortable or incongruous position. In the United States there is no federal allocation of deaths and the various States have either no system of allocation at all, or local and various systems, all differing from ours. Miss Parkhurst, in her paper, pleads for a system more logical than ours, but in avoiding some of our difficulties, it introduces others which, though rather less incongruous, appear to us more formidable obstructions to smooth working. . . .

Everybody agrees that some method of allocation is essential everywhere, but it is most necessary in the States where more people die in institutions than they do here, and where many institutions are outside the districts they serve. The Americans tell a story of a small town in which the number

of deaths from typhoid exceeded the entire population. The American ideal that deaths should be allocated to the districts in which the cause of death operated is higher and more logical than ours and seems not much more difficult to reduce to practice. It is an absurdity that if the women of a small village go to a maternity home in a neighboring town and die there from an outbreak of puerperal fever, the village, which was innocent, should be saddled with a high maternal mortality rate. Or, if the people of the same village go for a joy ride and meet with disaster, that their deaths should be laid on the village from which they set out. On the other hand, how are we to allocate the death of a person from dysentery who has long been resident in a mental hospital? Britain being a small and compact country with a central executive and a uniform health code, the absurdities of our system of registration are theoretical rather than real, for we have ready means of detecting them. In the United States, with its vast area and different population distribution, its division into semi-autonomous States with different health codes, it is not easy to check these absurdities; so we can understand why the Americans look upon our system as too faulty for their adoption. Miss Elizabeth Parkhurst's proposal is to adopt our system except that deaths from acute communicable disease occurring in institutions should not be referred to the place of former residence. This has been advocated by many British hygienists, but it is replete with difficulties.—*Medical Officer* (London), LVIII, 14 (Oct. 2), 1937.

Determining Population in Intercensal and Postcensal Years by Means of Continuous Population Registers*

DOROTHY SWAINE THOMAS, PH.D.

Director of Research in Social Statistics, Institute of Human Relations, Yale University, New Haven, Conn.

THE resident population of a given area at any point of time after a census enumeration can be determined by adding or subtracting the net change in numbers since the last enumeration. This net change is obviously a function of the number of persons entering and departing from the area. Entrance to a resident population group occurs when children are born to residents or when persons migrate into the area and establish residence. Departure occurs when residents die or migrate out of the area. The determination of net change from the last census enumeration to any specified point of time requires the drawing of a balance sheet for the interval, indicating on the positive side, the number of births to residents and the number of persons migrating into the area, and on the negative side, the number of residents dying and the number migrating out of the area.

The theoretical requirement for such a balance sheet is continuous registration, not only of births and deaths at the time of their occurrence and with proper allocation to the residence area, but also of all persons establishing and

giving up residence in this area. This requirement is met by the continuous system of population registers, now existing in Sweden, The Netherlands, and certain other European countries. The principles of registration in Sweden and The Netherlands are the same, although they differ in regard to details. The Swedish system has the following features:

1. The smallest local administrative unit, the parish or the community, is the unit for population registration.

2. The pastors of the State Church (functioning, however, as civil servants) are responsible for keeping the registers.

3. The basic register is a so-called community book which is revised after each decennial census. In this book data are arranged in terms of household groups, indicating for each resident his family and given names, sex, relationship to the head of the family, birth place and birth date, civil status at the time of inscription, religious affiliation, nationality and citizenship, occupation at inscription, address in the community and place of previous residence, if an in-migrant from another Swedish community or an immigrant from a foreign country.

4. Changes affecting civil status or citizenship are recorded for those who

* Read at Joint Session of the American Statistical Association and the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

continue as residents. A new entry, containing all the above details, is made for every child born to a resident woman and for all in-migrants or immigrants. Removal of the name from the register occurs upon emigration, out-migration, death or "disappearance," with an indication for out-migrants of the community of declared destination, and the date of the receipt of an attested inscription in the community declared as destination, or some other community.

5. Although registration is in terms of individuals, the household or family unit is preserved, and appropriate changes are made as the individual shifts from one household or family group to another within the community.

6. These registers represent the current resident population. Abstracts relating to all new inscriptions and removals are made in a series of books referring to births, deaths, and migrants, and summaries of these are prepared every year. Demographic occurrences affecting the factual but not the resident population are not recorded in the main community register, but appropriate notations are made in the birth register or death register, and a transcript is sent to the community of residence.

7. Residence is determined by fixed rules and definitions, depending initially upon the intention of the individual concerned, but revised in situations where intention does not correspond with fact. No one may be registered as a resident of more than one community at a time.

8. Every person intending to change his residence to another community is required to take out a migration certificate. A transcript of the demographic history and status of this person is sent to the community of destination, but his name is not removed from the register of the community of origin

until a receipt attesting in-migration has been received from the community of destination. This is the so-called "closed" system of population registration: theoretically, no out-migration occurs except in connection with a subsequent in-migration. This rule is obviously applicable only to internal migrants.

9. Since civil rights, duties, and benefits are determined on the basis of registration as a resident, a person who evades registration is considered to have no such rights or benefits. An annual check of the registers, in connection with tax declarations, always reveals a certain number of persons who have disappeared from the community without taking out migration certificates, or who, after taking out certificates, and leaving the community, have failed to register elsewhere. Such persons are kept in the community registers for two consecutive years, but if their destination is still unknown at the expiration of the second year, they are declared to be statistically "non-existent" (*obefintliga*), are removed from the main register and are relegated to a special "Register of the Non-Existent" from which, in turn, they are removed only upon an attested in-migration or death in another community or upon return to the community in question.

10. Although registration is decentralized, control is centralized. Central registers are kept for persons having no defined local residence but considered nevertheless as residents of the country.

The Dutch system is, in principle, the same, but differs in the details of administration, personnel, and the technic of bookkeeping. The two fundamental points of difference from the Swedish system, are, first, that the registers are kept by civil officers, and second, and more important, that a

new "Family-Individual-Card" system has recently been introduced, whereby the card made out for each individual upon birth or immigration to the country is sent by post to the various communities of destination within the country, and thus contains a cumulative record of the individual's demographic experiences, which are recorded as they occur until his emigration or death, when the card is deposited in the Central Statistical Bureau. As providing a basis for determining the population in any administrative unit in intercensal or postcensal years, however, the system operates precisely as the Swedish, and a description of its details is not relevant to this paper.¹

The essential features of continuous population registration common to the systems in Sweden and The Netherlands are: (1) there is a basic record of all residents determined at a census enumeration; (2) this basic record is subject to continuous revision by additions, subtractions, or modifications as changes occasioned by birth, death, marriage, dissolution of marriage, adoption, migration, and disappearance, occur; (3) there is a set of specific rules for determining residence; (4) the system is "closed" with respect to internal migration; and (5) civil rights, duties, and benefits are linked with registration.

The usefulness of the continuous register system in determining intercensal or postcensal population obviously depends upon the completeness and the promptness with which births, deaths, and migrants are registered. There seems to be very little doubt that both The Netherlands and Sweden maintain excellent control of the registration of births and deaths. In Sweden, the allocation of births to the community of residence of the mother is insured by a requirement that women entering maternity hospitals present their certificates of registration. The requirement of allocations to residence community however evidently causes some delays in completing the registration, and this situation tends toward an underestimate of population increase, for births outside the community, which should have been entered in the registers undoubtedly overbalance deaths of persons who should have been removed from the registers. Thus, even though omissions may be and probably are negligible in the long run, they may play a not unimportant rôle at any given point of time.

Control of migration registration presents greater difficulties than control of vital registration. It is particularly difficult to obtain a complete record of all emigrants from the country, since the "closed" system of registration can obviously not apply to

TABLE I
Internal Migrants

	<i>Sweden</i> ²			<i>The Netherlands</i> ³		
	<i>In</i>	<i>Out</i>	<i>In-Out</i>	<i>In</i>	<i>Out</i>	<i>In-Out</i>
1929	482,705	480,206	+2,499	488,781	489,421	-640
1930	526,166	523,674	+2,492	509,175	509,380	-205
1931	477,388	475,470	+1,918	439,843	442,167	-2,324
1932	481,479	478,938	+2,541	423,130	424,084	-954
1933	463,270	460,927	+2,343	414,877	415,196	-319
1934	471,704	469,221	+2,483	431,187	430,822	+365

(Average annual population, for these years, Sweden, about 6,180,000. Average population increase about 22,600.

Average population, The Netherlands, about 8,170,000. Average population increase about 115,000.)

emigrants. If the closed system were absolutely efficient in respect to internal migrants, the sum of the in-migrants, for the country as a whole, should equal the sum of the out-migrants, since, in theory, no out-migration can occur until an in-migration has been attested. Table I of in- and out-migrants for Sweden and The Netherlands in recent years shows the extent to which practice deviates from theory:

In Sweden the error is relatively constant and is always in the same direction, *i.e.*, a deficiency of out-registrations. If in-registrations could be taken as correct, under-registration of out-migrants would amount to about one-half of 1 per cent. In The Netherlands the differences have been proportionately less, reaching the Swedish level in only one of the years considered. The error is, generally, in the opposite direction, *i.e.*, an under-registration of in-migrants. It is impossible to know, however, the extent to which concealed compensating errors affect the total discrepancy, for two situations operate to produce the discrepancy: (1) The population registrar in the communities of destination may have neglected to notify the communities of origin that they have registered an in-migration, or the registrars in the community of origin may have neglected to delete an entry after receiving this notification. This will result in a deficiency of *out-migrants compared with in-migrants*.

(2) Migrants who intended to seek a destination within the country, and took out migration certificates may have changed their minds and emigrated from the country. If the registrar in the community of origin has, nevertheless, recorded these cases as out-migrants, this will result in a deficiency of *in-migrants compared with out-migrants*.⁴

Thus, the total error may be considerably larger than the apparent discrepancy, due to a compensating factor. These errors are, however, of the sort that can be diminished by improved administration of the closed feature of the registration system.

Even if the closed system operated with perfect efficiency, and practice of the registrars conformed with theory to the extent that every registered in-migration had its corresponding registered out-migration, there might still be a considerable degree of under-representation of migration, due to the failure of some migrants to apply for registration certificates. Both the Swedish and the Dutch systems attempt a correction of this error by periodic checks of the registers. In so far as the decennial census is complete, the cumulative errors are eliminated after each census, and the annual checks remove as many as possible, but always with a time lag, for "disappearance" is determined only after a specified absence (in Sweden, 2 years) from the

TABLE II

	Sweden ^a			The Netherlands ^b		
	Reentered in Community Book from "Book of the Non-existent"	Removed from Community Book to "Book of the Non-existent"	Reentries Minus Removals	Entered in Community Book "by Official Action"	Removed from Community Book "by Official Action"	Official Entries Minus Official Removals
1929	6,729	7,257	-518	5,830	9,525	-3,695
1930	7,773	8,081	-308	6,251	14,885	-8,634
1931	6,140	5,865	+275	5,319	2,614	+2,705
1932	6,504	5,349	+1,155	4,560	4,449	+111
1933	6,154	4,892	+1,262	2,688	5,394	-2,706
1934	5,022	4,628	+394	1,830	4,430	-2,600

community. Table II shows the annual removal from and reentries into the registers for the period 1929-1934.

The net effect of these entries and removals is not constant either in amount or direction. The census year 1930 shows the largest absolute figures for both entries and removals and in both countries. In addition to the relatively large correction of the registers at census years, the Swedish series over a longer period show that the fluctuations in the net figure are inversely related to the phases of the business cycle: it is an advantage to be registered as a resident during periods of depression, in order to obtain relief; it is an equal advantage to avoid registration during periods of prosperity in order to evade taxation! Furthermore, the effect of under-registration may operate differently with respect to rural and urban areas, for it is probable that the population in areas of maximum in-migration (*i.e.*, urban places) will be slightly underestimated in intercensal and postcensal periods, and the population in areas of maximum out-migration (*i.e.*, rural places) will be slightly overestimated.

The limitations of continuous population registers as sources for deter-

mining intercensal or postcensal population may be summarized as follows:

1. Errors in respect to births and deaths will depend upon the factor of delay in reporting extra-residential births and deaths to the residence areas. These errors will be relatively constant, and will result in a slight underestimation, particularly of rural areas which have no large maternity hospitals.
2. Errors due to under-registration of migrants will operate as follows:

- (a) A certain number of emigrants will escape registration entirely. This will cause a temporary overestimation of the population of areas of emigration.
- (b) Out-migrants (internal) may evade registration and this may cause temporary underestimation or overestimation of the population of the area affected. These errors are not constant and probably vary inversely with the business cycle, and probably also have a differential effect as between rural and urban areas, tending in general toward an overestimation of the former and an underestimation of the latter.

3. Errors due to incomplete registration of internal migrants will generally operate in

CHART I

SWEDEN: AGRICULTURAL POPULATION IN BLEKINGE, KRISTIANSTAD AND MALMÖHUS COUNTIES

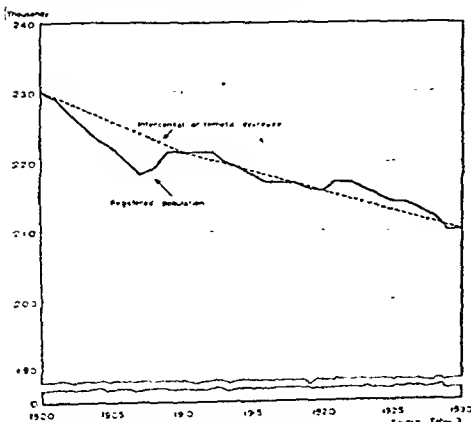
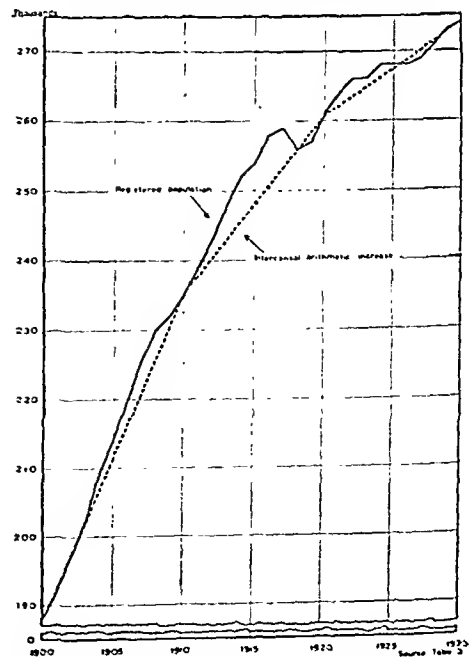


CHART II

SWEDEN: TOWN POPULATION IN BLEKINGE, KRISTIANSTAD AND MALMÖHUS COUNTIES.



the direction of an excess of in-migrants compared with out-migrants since these errors will be due to failure to maintain the closed system. The population of communities with inefficient removal of out-migrants from the registers will tend to be overestimated.

The net effect of all these errors will not be large if population registration is carefully controlled. The situation in The Netherlands and Sweden is favorable to such control, and it is possible that they have reached an

irreducible minimum of errors. In Sweden these various errors are taken into account in determining postcensal or intercensal population. An *estimate* is made of total migration gain or loss which is added to natural gain or loss to determine total population change. The combination of an accurate census and a well controlled community register, thus goes far toward solving the problem of determining postcensal and intercensal population.

TABLE III

Sweden: Population in Two Specified Groups of Communities in Blekinge, Kristianstad and Malmöhus Counties (as of Dec. 31 of Each Year)*

Year	Agricultural Communities			Towns		
	Registered Population (Thousands)	Calculated Intercensal Arithmetic Decrease	Per cent Deviation of Calculated from Registered	Registered Population (Thousands)	Calculated Intercensal Arithmetic Increase	Per cent Deviation of Calculated from Registered
1900	229.9	229.90		187.5	187.50	
01	228.6	229.05	+ .2	192.4	192.28	— .1
02	227.0	228.20	+ .5	196.8	197.06	+ .1
03	225.1	227.35	+1.0	202.3	201.84	— .2
04	223.1	226.50	+1.5	208.6	206.62	— .9
05	221.6	225.65	+1.8	213.7	211.40	—1.1
06	219.7	224.80	+2.3	219.6	216.18	—1.6
07	217.9	223.95	+2.8	225.7	220.96	—2.1
08	218.9	223.10	+1.9	229.6	225.74	—1.7
09	220.9	222.25	+ .6	231.7	230.52	— .5
1910	221.4	221.40		235.3	235.30	
11	221.3	220.82	— .2	238.7	237.85	— .4
12	220.8	220.24	— .3	243.2	240.40	— .1
13	219.5	219.66	+ .1	247.9	242.95	—2.0
14	219.0	219.08	+ .0	251.6	245.50	—2.4
15	218.0	218.50	+ .2	254.2	248.05	—2.4
16	216.9	217.92	+ .5	257.7	250.60	—2.8
17	216.9	217.34	+ .2	258.5	253.15	—2.1
18	217.3	216.76	— .2	255.5	255.70	+ .1
19	216.2	216.18	— .0	257.0	258.25	+ .5
1920	215.6	215.60		260.8	260.80	
21	216.9	215.02	— .9	263.7	262.14	— .6
22	216.5	214.44	— .9	266.1	263.48	—1.0
23	216.2	213.86	—1.1	266.4	264.82	— .6
24	214.7	213.28	— .7	267.5	266.16	— .5
25	214.1	212.70	— .7	268.1	267.50	— .2
26	213.8	212.12	— .8	267.7	268.84	+ .4
27	213.4	211.54	— .9	268.8	270.18	+ .5
28	212.0	210.96	— .5	270.7	271.52	+ .3
29	210.4	210.38	— .0	272.8	272.86	+ .0
1930	209.8	209.80		274.2	274.20	

* Unpublished tabulations (D. S. Thomas).

Before bringing this paper to a close, one further point should be made, and that is in regard to the strong cyclical movement in migration series, and particularly in the series representing net internal migration for relatively homogeneous areas. The cycles of migration gain which urban areas show during periods of prosperity and of migration loss (or diminished gain) during depression, when cumulated, may be sufficiently strong to produce marked cyclical fluctuations in the total population. Since censuses may fall at any phase of these cycles, it is extremely important to be able to describe this movement and measure the annual deviations, if intercensal or postcensal population estimates are to be used as bases for birth and death rates. The accompanying charts and tables (Table III, Charts I and II) show the extent of cyclical variations in the agricultural population on the one hand, and the town population on the other, in the most southerly tier of Swedish counties. Straight lines drawn between the population at consecutive census years indicate the fortuitous timing of census enumerations. When such strong population displacements occur, computed rates may be considerably in error unless cyclical variation is taken into account. The negative displacement of the line of arithmetical increase between the censuses of 1900 and 1910 amounts to 2.8 per cent for the agricultural communities at the cyclical maximum of 1907, and the same year showed a positive displacement of 2.1 per cent for towns although this percentage was exceeded during the war years when the line of arithmetical increase was 2.8 per cent above the observed value for 1916, and almost as great in the 2 preceding years. These population cycles are, of course, caused by the cumulative and combined action of cyclical variations in births, deaths,

and migrations. Of these three variables, migration has played the dominant rôle in the particular series considered, and this situation is probably true, in general, of industrialized countries at the present time. Due to the strong age selectivity of migration, these series for total population by no means indicate the disturbance produced by cyclical variations upon specific age classes. I am at present assembling data on this point for a selected group of communities and, although the analysis has not been completed, there is evidence that the maximum cyclical displacement of the age groups 15-30 is several times as great as that of the total population. We are greatly in need of more complete and accurate information about selective migration and its temporal variations if we are to be in a position to allow for its influence upon population development in intercensal and postcensal population estimates. Until we have information of the sort derived from continuous registers, our estimates are likely to introduce serious errors in all vital indices.

In conclusion, it may be said that an efficiently controlled system of continuous population registers, combined with careful periodic enumerations of the resident population probably provides the best possible basis for reliable postcensal and intercensal population estimates. The operation of these systems in Sweden and The Netherlands has been described, and the sources and extent of the registration errors have been analyzed. Finally, the extent of cyclical variations in intercensal population, due largely to net internal migration, has been shown for selected Swedish regions and their implications for computing vital rates discussed. It is hoped that the experience of Sweden and The Netherlands may be taken as a guide for future American policy, for

our need of accurate population accounting is at least as great as theirs.

REFERENCES

1. For the details of this interesting experiment in population registration, see: Methorst, H. W., and Lentz, J. L. Population Administration and the Family-Individual Card System in The Netherlands. *Population*, 2:42-65 (Nov.), 1936.

Thomas, D. S. "The Continuous Register System of Population Accounting." In: *Problems of a Changing Population*. Report of the Committee on

Population Problems. National Resources Committee (In press).

2. *Sveriges Officiella Statistik: Befolkningsrörelsen år 1933*, p. 1.

Sveriges Officiella Statistik: Befolkningsrörelsen år 1934, p. 1.

3. *Statistiek van den loop der bevolking van Nederland over het jaar 1934*, pp. 54-55.

4. This latter point was raised in connection with the German Meldestatistik in a report prepared for the Committee on Migration Differentials of the Social Science Research Council, by Fritz Meyer, of Kiel University.

5. *op. cit.* p. 1.

6. *op. cit.* pp. 54-55.

Appearing in February Number

Immunization Against Scarlet Fever Through Use of Formalinized Toxic Solutions

By Gaylord W. Anderson, M.D., Roy F. Fecmster, M.D., Dr.P.H.,
B. Barrett Gilman, M.D., John J. Pontas, M.D., Leo Ranc, Ph.D.,
Elliott S. Robinson, M.D., Ph.D., and Angeline D. Hamblen

Scarlet Fever Immunization

By Edwin H. Place, M.D.

The Health Department in the Field of Medicine—From the
Standpoint of a Health Official

By Robert H. Riley, M.D., Dr.P.H.

Health Education for the Millions

By Louis I. Dublin, Ph.D., and Homer N. Calver

Syphilis Control in Industry

By R. R. Sayers, M.D.

Comparative Methods of Diagnosis of Rabies in Animals

By Charles N. Leach, M.D., C.P.H.

Epidemic Diarrhea of the New-Born*

III. Epidemiology of Outbreaks of Highly Fatal Diarrhea Among New-Born Babies in Hospital Nurseries

SAMUEL FRANT, M.D., F.A.P.H.A., AND
HAROLD ABRAMSON, M.D.

*Epidemiologist and Director, Bureau of Preventable Diseases; and
Field Epidemiologist, Department of Health, New York, N. Y.*

ONE of the main objectives of the medicine of today is the prevention and control of disease. The accomplishment of this aim is dependent, of course, on a sound understanding of the epidemiological characteristics of disease entities and on the application of the fundamental principles of modern preventive medicine to their control. To a gratifying degree success has attended efforts to erect suitable barriers against the occurrence and spread of certain diseases, as for example, typhoid fever, smallpox, diphtheria, and tuberculosis. However, present methods for the prevention of diarrheal disorders are still singularly inadequate. The persistent prevalence of enteritis not only among adults, but more particularly among infants and children, remains a problem challenging concerted attempts at solution. The situation is further complicated by the fact that almost as rapidly as public health measures are elaborated against recognized forms of diarrheal disorders, new types arise and confound efforts directed toward the ultimate goal.

In the summer of 1934 an unusual number of deaths were taking place among normally delivered new-born babies in the nurseries of one of the general hospitals in New York. The infants were succumbing to a fulminating form of intestinal intoxication whose clinical course could not be stemmed by recognized methods of therapy. When the outbreak finally abated 72 babies had been attacked and 32 had died.

Since this initial outbreak, somewhat over 3 years ago, we have had the unusual opportunity of following 23 such outbreaks in 15 hospitals giving maternity care. The statistical data are shown in Table I, as well as the sequence of events in connection with these outbreaks. From July, 1934, to July, 1937, we have followed the post-natal course of 4,594 live-born babies delivered at the times indicated in the table.

Among these, 711 cases of the disorder are known to have developed with an attendant average morbidity rate of 15.5 per cent. Of the sick infants 335 died, the average mortality rate being 7.3 per cent of the infants exposed, and the case fatality rate 47.0

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

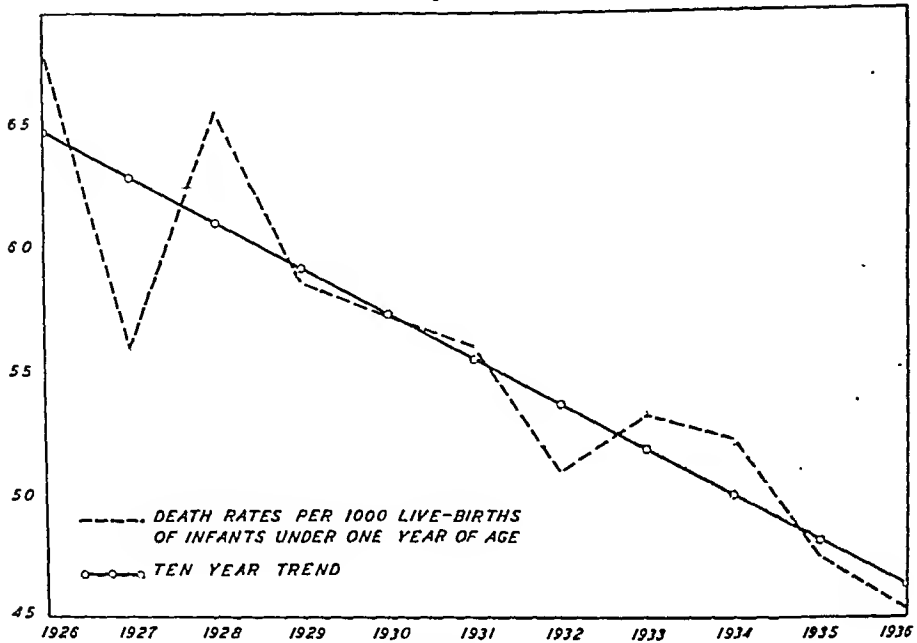
TABLE I

Chronologic Summary of Outbreaks of Epidemic Diarrhea of the New-Born in New York City from July, 1934, to July, 1937

<i>No. Hosp.*</i>	<i>Barough</i>	<i>Dates of Outbreaks</i>	<i>Season</i>	<i>Total Number Live-born Babies</i>	<i>Total Number Cases of Epidemic Diarrhea</i>	<i>Per cent Morbidity</i>	<i>Total Number Fatal Cases</i>	<i>Per cent Mortality</i>	<i>Case Fatality Rate</i>
1. A (1)	Queens	July-Sept. 1934	Summer	386	72	18.0	32	8.3	44.0
2. A (2)	Queens	Feb.-Apr. 1935	Winter-Spring	190	32	17.0	16	8.4	50.0
3. B	Brooklyn	Apr.-June 1935	Spring	520	58	11.0	23	4.4	38.0
4. C (1)	Bronx	July 1935	Summer	65	32	49.0	14	21.5	44.0
5. D (1)	Bronx	July-Aug. 1935	Summer	181	8	4.0	5	3.0	63.0
6. E	Bronx	Sept.-Dec. 1935	Fall	498	34	7.0	30	8.0	88.0
7. F	Manhattan	Oct.-Nov. 1935	Fall	41	18	44.0	0	0.0	0.0
8. D (2)	Bronx	Dec.-Jan. 1935-36	Winter	154	23	15.0	8	5.0	34.0
9. G (1)	Manhattan	Jan. 1936	Winter	63	29	46.0	7	11.0	24.0
10. C (2)	Bronx	Jan.-Feb. 1936	Winter	80	8	10.0	3	4.0	38.0
11. H	Queens	June-July 1936	Summer	79	28	35.0	17	21.5	55.0
12. I (1)	Brooklyn	June-Aug. 1936	Summer	226	43	15.0	21	9.3	49.0
13. G (2)	Manhattan	July-Oct. 1936	Summer-Fall	701	48	7.0	26	4.0	54.0
14. J	Manhattan	July-Oct. 1936	Summer-Fall	354	54	15.0	19	5.4	35.0
15. K	Manhattan	Sept.-Oct. 1936	Fall	91	14	15.0	11	12.0	79.0
16. C (3)	Bronx	Dec. 1936	Winter	43	4	9.0	2	5.0	50.0
17. L	Bronx	Dec.-Jan. 1936-37	Winter	28	10	36.0	3	10.0	30.0
18. M	Brooklyn	Dec.-Jan. 1936-37	Winter	229	34	15.0	29	13.0	85.0
19. N	Manhattan	Mar. 1937	Winter	128	52	40.0	16	12.0	29.0
20. I (2)	Brooklyn	Mar. 1937	Winter	66	24	36.0	7	11.0	29.0
21. O	Brooklyn	Mar.-Apr. 1937	Spring	56	12	21.0	5	8.0	41.0
22. G (3)	Manhattan	Apr.-May 1937	Spring	233	38	15.0	28	11.0	74.0
23. C (4)	Bronx	May-June 1937	Spring-Summer	182	36	19.8	13	7.0	50.0
Totals				4,594	711	15.5	335	7.3	47.0

* The letters designate the various hospitals. The numbers in parentheses denote recurrent outbreaks in the same institution.

FIGURE I—Infant Mortality, New York City, 1926–1936



per cent. In addition to the above morbidity and mortality, there also occurred an incidental neonatal mortality of 32 per 1,000 live-births from causes other than diarrhea, as well as a still-birth ratio of 29.

As the events of the various epidemics were followed we were impressed by the fact that we were confronted with a novel clinical entity in new-born babies, characterized by marked diarrhea, intense dehydration, toxicity, and early death. In a preliminary paper with Rice and Best,¹

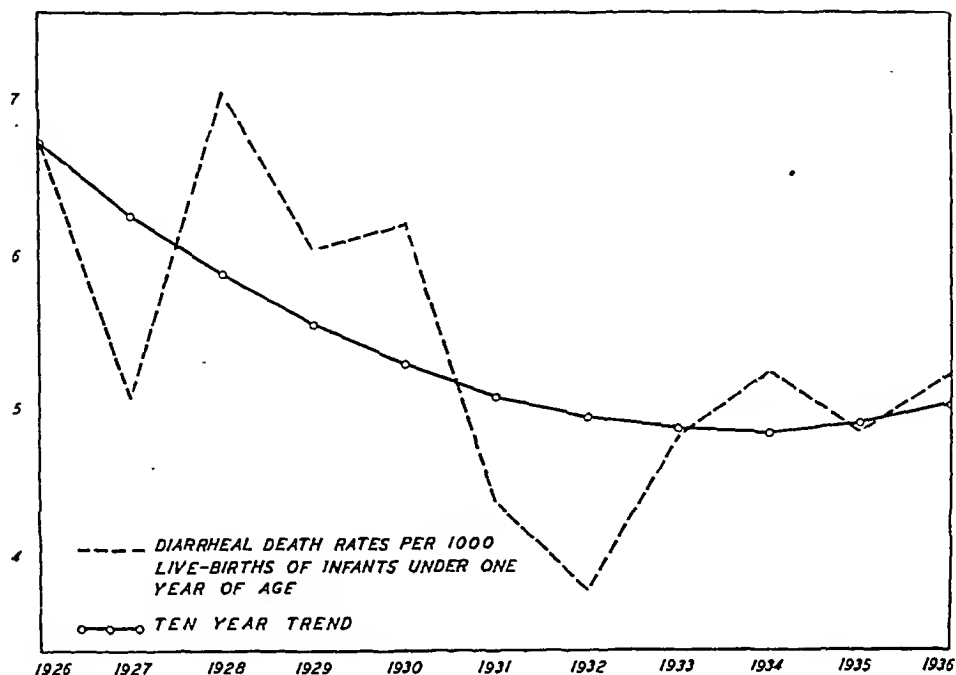
the essential clinical features of this disorder, "Epidemic Diarrhea of the New-Born," were summarized and the fact was stressed that despite extensive bacteriologic, serologic, and pathologic studies, the etiology still remained obscure. The literature afforded meager information on the problem, but in view of the many communications received by us, we are of the opinion that the disorder is of more frequent and widespread occurrence than reports indicate.

Indeed, the prevalence of this epi-

TABLE II
Seasonal Variations of Outbreaks of Epidemic Diarrhea of the New-Born

Seasons	Number Live-born Babies	Cases of Epidemic Diarrhea		Mortality		Case Fatality Per cent
		Number	Per cent	Number	Per cent	
Spring	1,086	160	14.7	77	7.1	48.1
Summer	1,465	234	15.9	112	7.7	47.8
Fall	1,157	117	10.1	63	5.4	53.8
Winter	886	200	22.6	83	9.4	41.5
Totals	4,594	711	15.5	335	7.3	47.0

FIGURE II—Infantile Diarrheal Death Rates, New York City, 1926–1936



demetic form of diarrheal disease among new-borns is reflected in New York City's infant mortality statistics. For the past 10 years or more, considerable attention has been directed by public health authorities toward the new-born period of life and particularly toward the evident failure to effect a substantial reduction in neonatal mortality. Rice and his collaborators² have shown that the death rates from all causes of infants under 1 year of age have steadily decreased during the past 20 years, but that when the general death rates of infants under 1 month are considered separately, exceedingly little has been accomplished in lowering mortality in this age group.

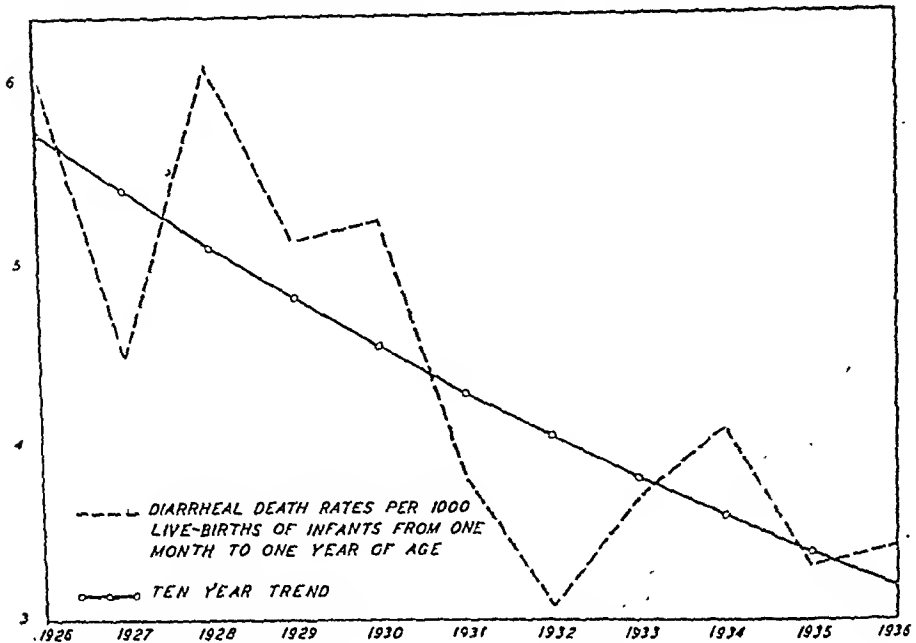
The death rate in the age group, 1 to 12 months, inclusive, has decreased 68 per cent (from 63.8 in 1916 to 20.7 per cent in 1935); that of infants in the neonatal period only 21 per cent (from 36.8 to 29.1 per cent). In this connection analysis of the neonatal death rates from the point of view of diarrheal disorders strongly indicates

that the persistently high incidence of mortality among the newly-born is due in great measure to diarrheal disease. The curves in Figures I–IV illustrate this point clearly.

Figure I shows the constant downward trend 1926–1936 in infant mortality rates under 1 year of age. Figure II, representing diarrheal death rates during this same period of life, discloses a definite trend upward since 1932. But the curve for the age period 1 month to 1 year for diarrheal conditions displays a progressively descending trend (Figure III). Not so, however, with the curve in Figure IV, diarrheal death rates of babies under 1 month of age. Note the steady ascent in the trend in mortality for 1926–1936, and more especially since 1931–1932. These curves are a graphic indication of the importance of the previously unrecognized clinical entity "Epidemic Diarrhea of the New-Born," and its effect on New York City's infant death rate.

Epidemiologically this disease shows

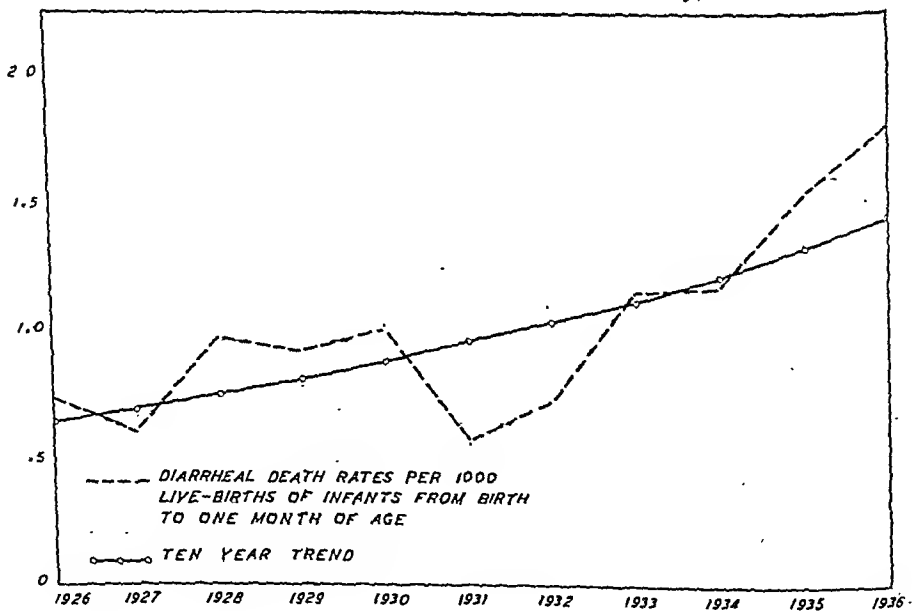
FIGURE III—Infantile Diarrheal Death Rates, New York City, 1926–1936



the following characteristics: It involves specifically new-born babies during the first 3 or 4 weeks of life. No sex differences are present and, quite unlike the "summer diarrhea" of the past, but little variation is ex-

hibited in morbidity and mortality from one season to another. The data indicate that the rates are lowest during the fall and highest during the winter. There is, however, no clear-cut rise in the fall-winter season, thus linking the

FIGURE IV—Infantile Diarrheal Death Rates, New York City, 1926–1936



disorder to respiratory infections prevalent at this period, nor in the spring-summer months so frequently associated with other diarrheal conditions. The spring-summer incidence is but little different from that of the fall-winter incidence; the mobility, mortality and case fatality percentages are practically the same (Table II).

From the few reports which have appeared¹ and from personal communications with the authors, it seems that geographically the disorder has thus far been recognized only in cities of the United States and in other countries lying within the North Temperate Zone.* With respect to feeding, no differences are evident in the incidence of the disease among either breast-fed or artificially-fed infants. However, this distinction is no longer so sharply defined because of the present practice of giving supplementary feedings to nearly all new-born babies. Although infants born to mothers of the poorer classes of the city have been attacked most heavily, yet babies of the better classes are also affected, depending upon the operating interrelationships of the ward and private maternity services of the various individual hospitals.

Once the infection gains foothold in a nursery, the apparent mode of spread is from baby to baby lying in adjacent bassinets. Not infrequently a pre-existing nursery infection such as thrush or impetigo appears to set the stage for the outbreak. The first cases of the disorder occur sporadically. A short interval-free or latent period may then intervene, to be followed by a rapid succession of cases in close sequence. At times intervals of several days may elapse between new crops of

cases. The earliest instances of the disorder have occurred on the second day of postnatal life, other babies have been attacked as late as the 31st day, depending on the time of exposure to the disease.

During the investigations of the outbreaks, attention was directed toward tracing the path of transmission. Careful inspection was made of all possible common points of contact, such as may arise in the labor and delivery rooms, in the nursery and in the formula kitchen. In addition, a close check was made of the adult personnel on the obstetrical services, as well as of the nursery and diet kitchen staffs, and of the mothers in the maternity wards. However, despite extensive bacteriological studies of food, water, and equipment, and of nasal and pharyngeal secretions and stool specimens, the etiology of the disease and its point of origin were not revealed, nor could the inciting agent be isolated from the respiratory or gastrointestinal tracts of infected babies. Autopsy studies and tissue virus cultures likewise failed to reveal the etiological factor.

The prevalence of this epidemic form of diarrhea with its associated high mortality rates constitutes a situation requiring immediate attention. Moreover, in its broader aspects it is inextricably bound up with the general lowering of morbidity and mortality among the newly-born. As the initial epidemics were followed, we recognized early the necessity for a complete revision of present methods for the care of the new-born in hospital nurseries. We feel that the usual methods of obstetrical and pediatric practice and of preventive medicine have failed to cope efficiently with the situation. Epidemiologically, it would seem that very definite fundamental changes in the manner of conducting maternity and new-born services would prevent the

* These cities are Seattle, Wash.; Chicago, Ill.; Toronto, Can.; Memphis, Tenn.; New York, Rochester, and Buffalo, N. Y.; Teaneck, N. J.; Cincinnati and Cleveland, O.; Edinburgh, Scotland, and Garches, France.

occurrence not only of the disorder which we have described, but of infectious diseases in general among neonatal infants. Technics can be evolved which would break the chain of transmission of disease peculiar to the newborn.

Such measures we have discussed in a recent report.³ They comprise immediate closure of infected nurseries and suspension of maternity services. We have also advanced suggestions for the prevention of the disorder as well as of infectious diseases in general in the neonatal group. It is not within the scope of this paper to review in detail these methods. It will suffice to state that they are based on the principles of surgical asepsis, and aseptic nursing and medical care. They are founded on efficient and workable methods which have long been adopted in contagious disease hospitals and in child-caring institutions. In advancing these proposals we fully realize that in their details modification may be necessary to meet local conditions. However, the basic principles involved are fundamentally sound. The measures were formulated to fit the construction and equipment of maternity services as they exist today. As far as the future is concerned, complete revision must be made in plans for housing maternity and new-born services in hospitals, greater stress being laid on the individual care of the mother and her new-born baby.

In conclusion, it should be added that as a result of recognition of the problem, a comprehensive program has been mapped out in New York City in an effort to reduce neonatal morbidity and mortality. The Sanitary Code has been amended listing as a reportable condition "Diarrhea in the New-Born up to 3 weeks of age occurring in a hospital giving maternity care." The terminology is designated broadly to

include all types of diarrheal disturbances in order to determine early the existence of the epidemic form of the disease. We are also investigating all infant deaths under 1 year of age to determine by case history records and by post-mortem examinations the accuracy of diagnosis as listed on death certificates. This phase of the problem has been discussed in detail in the recent paper by Bundesen and his co-workers.⁴

SUMMARY

Attention is called to an unusual chain of outbreaks during the past 3 years of highly fatal diarrhea affecting new-born babies during their period of customary care in hospital nurseries. Extensive bacteriologic and pathologic studies have failed to shed light on the etiology of the disease. The epidemiologic features of the disorder are discussed and the fact is stressed that we are confronted with a situation requiring a closer scrutiny by public health authorities and by practising obstetricians and pediatricians of our present medical and nursing care of the new-born baby.

Although a satisfactory reduction has been evidenced in death rates from all causes among infants from 1 month to 1 year of age, an analysis of the vital statistics records of New York City indicates that we have accomplished exceedingly little in effecting a suitable lowering in the death rates among infants in the neonatal period. In fact, as far as diarrheal deaths are concerned, our data show a steady ascent in mortality among new-born babies during recent years. We attribute this increased mortality to the previously unrecognized clinical entity "Epidemic Diarrhea of the New-Born."

REFERENCES

1. Rice, J. L., Best, W. H., Frant, S., and Abramson, H. Epidemic Diarrhea of the New-Born: I. Preliminary Considerations on Outbreaks of Highly

Fatal Diarrhea of Undetermined Etiology Among New-Born Babies in Hospital Nurseries. *J.A.M.A.*, 109:475-481 (Aug. 14), 1937.

2. Rice, J. L., Barnard, M., Duffield, T. J., and Blumenthal, J. L. Infant Mortality in New York City. *A.J.P.H.*, 27:701-706 (July), 1937.

3. Frant, S., and Abramson, H. Epidemic Diar-

rhea of the New-Born: II. Control and Prevention of Outbreaks in Hospital Nurseries. *J. Pediat.* To be published.

4. Bundesen, H. N., Fishbein, W. I., Dahms, O. A., and Potter, E. L. Factors Responsible for Failure to Reduce Infant Mortality. *J.A.M.A.*, 109: 337-343 (July 31), 1937.

The Taxpayer and Public Health

... Taxpayers will not grudge the small part of their tax dollar which goes for public health if they are told in concrete terms what public health means to them.

Health administrators should travel incognito in buses and in other public places, tempting strangers to discuss the commonplaces of their administrative machinery. They will be surprised to find how few have any conception of the functions of the public health nurse or of a sanitary engineer. On the other hand, they will find to be remarkably prevalent superstitions about public health which ought long ago to have become extinct. They will find citizens complaining because the neighbor's house was not fumigated after a case

of poliomyelitis had occurred in it. They will find a small, hard-headed but important group who, when it has learned what the health officer does, will be more than ever dissatisfied; who quite sincerely believe that his efforts are more sentimental than beneficial: "All this rescuing of the unfit is dysgenic and eventually will ruin the race." And always there will be the uncompromising liberals who resent every encroachment on individual liberty. A reasoned defense of the intention of public health in its fundamental aspects must be presented from time to time.—J. Rosslyn Earp, *Health News*, New York State Health Department, Albany, N. Y., Dec. 20, 1937.

Experiments on Antirabic Vaccination With Tissue Culture Virus*

LESLIE T. WEBSTER, M.D.

Rockefeller Institute for Medical Research, New York, N. Y.

AN outstanding problem in rabies today is the control of canine infection. In humans in the United States Registered Area, the disease is not increasing, for the number of cases has remained at 50 to 100 per annum for 14 years and, even in the states in which the disease in dogs is most prevalent, has not risen above 2 to 5 annually. In small, wild animals the disease is sometimes present and in livestock may assume epidemic proportions. But rabies, as recognized in this country, is chiefly an infection of dogs and is transmitted mainly through their bite.

To control canine rabies, two measures generally have been invoked—first, elimination of strays and confinement or appropriate muzzling of owned dogs to check the spread of the virus; second, vaccination of the dog population to increase its resistance. Restrictions have always been unpopular in this country despite their success in England; vaccination here is becoming widespread although its beneficial effects are in dispute. According to Umeno and Doi, one injection of phenolized vaccine was given to 215,000 dogs in the province of Tokyo with the result that 0.07 per cent subsequently

developed rabies in contrast to 5.5 per cent among 30,000 unvaccinated dogs. Dennison reported similar favorable results in Alabama, but most observers find that the vaccine either does not protect the dogs (Schoening, Giese) or is virulent and induces rabies following vaccination (Giese, Michin, Schern, Hermann, etc.).

Krause, in his general review in the *Kolle, Kraus, Uhlenhuth Handbuch*, summarizes the problem well in stating that the question is extremely difficult to solve in the field and requires experimental evidence from the laboratory. This laboratory evidence, he thinks, is not yet at hand, inasmuch as the technic has involved the use of a test inoculation of virus which is either too small to yield comparable results in the unvaccinated controls or too massive to permit survival of the vaccinated group. Finally, workers on virus diseases in general raise two questions which bear on antirabic vaccination: (1) Is a non-virulent vaccine, especially when given in one dose, capable of immunizing dogs? (2) Is not the brain tissue vehicle which contains the virus responsible, in part, for post-vaccinal paralyses? The problem remains, therefore, to find an effective yet safe vaccine.

To develop such a vaccine, the following experiments have been carried out in our laboratory. First of all,

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

we chose as test animals mice of a selected Swiss strain, 100 times more susceptible to rabies than rabbits, guinea pigs, monkeys, and dogs in published tests. Next we discovered that the mice could be readily immunized against an intracerebral injection of test virus containing up to 10,000 lethal doses. A single intraperitoneal injection of at least 1,000 intracerebral lethal doses rendered mice resistant within 14 days and over a period of at least 9 months. Neutralizing antibodies were likewise present.

Having learned that these mice could be measurably immunized, we then examined various commercial preparations with respect to their immunizing capacities. None immunized the mice when given according to directions in a single dose in a quantity at least 10 times that administered to dogs per gram of body weight. If 6 or more doses were employed, however, a few vaccines immunized against 10 to 100 lethal doses, especially those found to contain virulent virus. One or two phenolized preparations containing no virulent virus showed mild immunizing potency following repeated injections. In all, we concluded that a single dose of present commercial canine vaccines does not render mice immune to the smallest measurable dose of test virus.

At this point, the possibility of a new source of vaccine was investigated. Preparations in current use are composed largely of virus-containing brain or cord tissue of rabbits, sheep, or monkeys. Nervous tissue is not only a superfluous but a potentially dangerous vehicle which may produce paralysis following vaccination, hypersensitivity, or secondary infections. Until now, however, no other source of virus has been available and the nervous tissue has remained inseparable from the virus. In the fall of 1936, however, the propagation of rabies virus

in culture media outside the animal body was reported by Kanazawa in Japan, and by Webster and Clow in New York. Our cultures have been continued unremittingly now for 95 passages and have become uniformly virulent through the 1/10,000 dilution. The technic of propagation is carried out in the following manner. Using aseptic technic throughout, 50 c.c. Erlenmeyer flasks are prepared with 4 c.c. of Tyrode solution containing 10 per cent normal monkey serum plus 0.02 c.c. of a suspension of minced mouse embryo brain. This flask culture medium is then inoculated with 1 c.c. of a 1 to 100 dilution of the brain of a mouse prostrate on the 7th or 8th day following an intracerebral injection of rabies virus. At 3 to 4 day intervals, the contents of the flask is withdrawn to a centrifuge tube, allowed to settle, and 2.5 c.c. of the relatively clear supernatant is transferred to a second culture flask. This passage technic is repeated routinely and the virulence of the culture virus is titrated by inoculating the material intracerebrally in tenfold dilutions in Swiss mice. As a source of vaccine the culture virus has the following advantages. It contains very little brain tissue, is practically water-clear, is of measurable, uniform virulence, keeps at least 60 days in bulk or in a frozen and dried state at icebox temperature.

This culture virus was tested for its ability to immunize mice. One-quarter c.c. of the undiluted culture, equal to 80,000 intracerebral lethal doses, was harmless when injected intraperitoneally and protected them in 14 days against a test intracerebral injection of 1,000 lethal doses of mouse brain virus. One-tenth of this amount of culture vaccine was likewise effective but 1/100, containing only 800 lethal doses, was insufficient for immunization. Immunity, when produced, endured at least 9

months and was accompanied by protective antibodies.

Attempts were then made with culture virus to immunize beagle puppies. At the outset it was necessary to establish the lethal dose for dogs of the virus to be used in testing the success of the vaccination. Mouse-brain virus, obtained originally from a skunk, was injected intracerebrally into the dogs in 1 c.c. amounts in dilutions ranging from 10^{-2} and 10^{-8} gm. In 5 tests in which the 10^{-4} dilution was given, all of 5 dogs succumbed; in 6 tests in which the 10^{-5} dilution was given, 9 of 11 dogs succumbed; in 6 tests in which the 10^{-6} dilution was given, 2 of 8 dogs succumbed. The minimum lethal dose of the virus for dogs in this intracerebral test was taken as the least amount giving 50 per cent or more mortality, namely, 1 c.c. of 10^{-5} dilution. Dogs were vaccinated with relatively small amounts of culture virus, 5,000 to 20,000 mouse lethal doses, barely 20 times that required to immunize mice. The vaccine has proved harmless to all 45 dogs thus far treated and has immunized them as follows. In the first test, 7 of 7 vaccinated dogs resisted 1

lethal dose of test skunk virus given 3 weeks later. In the second test, 4 of 4 vaccinated dogs resisted 1 lethal dose and 1 of 3, 10 lethal doses. In the third test, 3 of 3 vaccinated dogs resisted 1 lethal dose and 2 of 3, 10 lethal doses. In all, 14 vaccinated dogs all resisted 1 lethal dose fatal to 9 of the 11 controls. This difference is statistically significant. Likewise, 3 of 6 vaccinated dogs resisted 10 lethal doses fatal to all 5 tested controls. This difference, however, is not significant. The 15,000 mouse lethal doses of culture vaccine which immunized dogs against 1 test lethal brain dose can be contained in 1 c.c. and can be increased apparently without harm to 1,000,000 mouse lethal doses. With a larger amount of mouse lethal doses in the vaccine, a greater resistance is expected.

This evidence that dogs can be successfully immunized with a single injection of culture virus concludes our present report. Further experiments aimed at reducing still further the virulence of the culture vaccine without destroying its immunizing potency are now in progress and will be submitted in the near future.

Relation of Lymphocytic Choriomeningitis to Acute Aseptic Meningitis (Wallgren)*

R. D. BAIRD, M.D., AND THOMAS M. RIVERS, M.D., Sc.D.

*Hospital of The Rockefeller Institute for Medical Research,
New York, N. Y.*

THE discovery of the virus of lymphocytic choriomeningitis was reported in 1934 by Armstrong and Lillie.¹ In 1935, Traub² described experiments showing that the virus is frequently demonstrable in normal-appearing mice. Also in 1935 Rivers and Scott³ recovered the virus from the spinal fluid of 2 patients suffering with a disease fulfilling the criteria laid down by Wallgren⁴ for the diagnosis of "acute aseptic meningitis" and definitely showed that the virus was the etiological agent responsible for their malady.

Wallgren⁴ considered acute aseptic meningitis a clinical entity and laid down the following criteria for its diagnosis: Sudden onset of meningeal symptoms associated with a slight or moderate increase in the number of cells, especially lymphocytes, in a bacteria-free spinal fluid; a benign course with no complications; the absence of a focus of acute or chronic infection in the vicinity of the brain, for example sinusitis; and the absence from the community of diseases known to be

capable of producing irritation of the meninges.

Inasmuch as the 2 proved cases described by Rivers and Scott^{3, 5, 6} and the one proved case cited by Armstrong and Dickens⁷ satisfied criteria for the diagnosis of acute aseptic meningitis it has been suggested by certain workers that all cases satisfying these criteria are caused by the virus of lymphocytic choriomeningitis. However, Rivers and Scott⁶ have already presented some evidence that all cases of acute aseptic meningitis are not caused by this virus, and recently Armstrong and Wooley⁸ obtained additional evidence which leads them "to feel that the clinical entity 'aseptic meningitis' is made up of more than one etiological entity." In spite of these reports there is still a tendency on the part of some investigators and clinicians⁹ to assume or to imply that all cases of acute aseptic meningitis are caused by the virus of lymphocytic choriomeningitis. In view of this, we have examined the spinal fluid and blood from a number of cases of aseptic meningitis in order to determine how frequently this new virus is responsible for disease of the central nervous system in man. Furthermore, we have examined the his-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

tories of these cases and the ones reported in the literature to see if it is possible to differentiate clinically the ones caused by the virus from those that are not.

For therapeutic purposes, Lepine and his coworkers¹⁰ have infected human beings with a murine strain of lymphocytic choriomeningitis virus; about half of the inoculated patients developed meningeal involvement while the others exhibited fever and influenza-like symptoms. Furthermore, it has been shown⁸ that many individuals without histories of having had any involvement of the central nervous system possess neutralizing antibodies against the virus of lymphocytic choriomeningitis. Consequently, it appears that an individual can be and not infrequently is infected with this virus without the central nervous system being obviously involved. Since we have been chiefly interested in the relation of the virus to acute aseptic meningitis we have not directly concerned ourselves with the non-meningeal form of disease caused by it.

MATERIALS AND METHODS

Spinal Fluid and Blood—Specimens of spinal fluid and blood from 65 cases of suspected acute aseptic meningitis were sent to us by physicians in different parts of the United States and Canada. We were unable to see the cases or to direct the manner in which they were handled; consequently, the histories and physical examinations were not so complete as they might have been, and many specimens essential for a laboratory diagnosis of lymphocytic choriomeningitis were not obtained. A number of the specimens came quite a distance by mail and this may account for our inability to recover the virus from certain cases.

Later we discovered that 31 of the 65 cases did not fulfil the requirements

for a diagnosis of acute aseptic meningitis; among the 31 cases, diseases such as tuberculous meningitis and post-infection encephalitis were represented. The results obtained with material from this group served as excellent negative controls, but otherwise were of no significance.

Animals—Mice and guinea pigs from stocks known to be free from the virus of lymphocytic choriomeningitis were used in all experiments and tests.

Isolation of Virus—Details of the technic of isolating the virus of lymphocytic choriomeningitis from materials obtained from human beings and the method of identifying it have been described by Rivers and Scott.^{5, 6}

Neutralization Tests—The neutralization test employed in this work is different from the one used by Scott and Rivers⁵ and Wooley, Armstrong, and Onstott¹¹; it was devised by Muench and Scott and a detailed description of it with the statistical data supporting it will appear later. All neutralization tests in this laboratory have been done with the W.E. strain of virus. From an examination of the results obtained with known positive sera and with known negative sera it became obvious to Muench and Scott that a 10^{-2} dilution of the virus was the critical one in the tests regardless of variations in the titer of the virus emulsion used. Such a statement applies only to this particular strain of virus which has been passed in guinea pig brains since isolation. In order to use another strain of virus in the manner to be described, its critical dilution would have to be determined by statistical methods.

The brain of a guinea pig inoculated with the W.E. strain of virus is removed aseptically at the height of the disease; by weight a 10 per cent emulsion in Locke's solution is made and called virus stock emulsion. A 10^{-2} dilution

is made of the stock emulsion and 1 c.c. of it is mixed with 1 c.c. of each serum to be tested. In all experiments a positive and a negative control are included. The mixtures of virus and serum are allowed to stand in an incubator at 37° C. for 1 hour, after which 0.5 c.c. of each mixture is injected subcutaneously into each of 4 guinea pigs; the animals are observed for 18 days. If 3 or 4 pigs survive, neutralizing antibodies are present; if 3 or 4 pigs die, neutralizing antibodies are considered to be absent; if 2 pigs die, the significance of the result is doubtful.

Results of tests made in the manner just described are much easier to interpret than are those of tests previously used. It is possible that a weakly positive serum may be missed occasionally. However, such an error is not to be deplored in this type of work.

RESULTS OF ATTEMPTS TO DEMONSTRATE VIRUS IN SPINAL FLUID AND BLOOD

Spinal fluid from 41 patients and blood from 11 of them, collected during the acute stage of disease, were examined for the presence of virus. Twenty-three of the specimens of spinal fluid and 9 of blood came from 23 cases that subsequently were found not to satisfy the criteria for a diagnosis of acute aseptic meningitis. Spinal fluids from only 2 of the patients whose convalescent blood showed neutralizing antibodies were examined, and they were collected late in the course of the disease. In none of the specimens of blood or spinal fluid was virus demonstrated.

Spinal fluid from 1 case of aseptic meningitis produced a mild febrile illness in guinea pigs, but this illness could not be produced in more than one or two successive lots of pigs. Furthermore, the pigs after recovery were not immune to the virus of lymphocytic choriomeningitis. If an in-

fectious agent was responsible for this mild illness in the animals its source and identity were not determined.

RESULTS OF NEUTRALIZATION TESTS

Attempts were made to obtain serum from patients early in the course of disease and again 6 or 8 weeks after the onset of illness. In some instances we obtained both specimens; in others we secured a specimen only at the onset or after recovery. With these sera neutralization tests were promptly carried out in the manner described above.

Neutralization tests were performed on sera from 32* cases satisfying the criteria for a diagnosis of acute aseptic meningitis. On a basis of the time of collection of the sera and the results of the neutralization tests the cases have been grouped in the following manner:

One proved case of lymphocytic choriomeningitis; serum did not neutralize at onset but did after recovery.

Seven presumptive cases of lymphocytic choriomeningitis; serum was not collected at onset of illness, but the specimen secured during convalescence contained neutralizing antibodies. Under such conditions it was impossible to be certain that the antibodies were not the result of a previous unrecognized infection with the virus.

Twenty-one cases of acute aseptic meningitis not caused by the virus of lymphocytic choriomeningitis; demonstrable neutralizing antibodies were not present in the sera collected from patients who had recovered.

Three equivocal cases; antibodies were not present in sera collected at onset of disease, but it has been impossible to obtain sera from the patients after they had recovered.

For the sake of convenience both proved and presumptive cases of lymphocytic choriomeningitis will be referred to as positive cases in the remainder of the paper, while cases of acute aseptic meningitis not caused by the virus of lymphocytic choriomeningitis

* We had 34 cases satisfying the criteria for a diagnosis of acute aseptic meningitis, but from 2 of them we received only spinal fluid for examination.

TABLE I

Summary of Signs and Symptoms Found in 23 Positive and 19* Negative Cases

Signs and Symptoms	23 Positive			19 Negative		
	Present	Absent	No Record	Present	Absent	No Record
Influenza-like prodrome	16	7	..	3	15	1
Fever	20	2	1	17	2	..
Headache	20	2	1	15	2	2
Nausea and/or vomiting	18	5	..	14	4	1
Nuchal rigidity	18	1	4	17	2	..
Kernig's sign	12	5	6	12	3	4
Reflexes, hyperactive	4	14	5	5	12	2
Reflexes, hypoactive	6	12	5	5	12	2
Babinski's reflex	7	9	7	5	12	2
Localized neuropathy	5	18	..	5	14	..
Residual neuropathy	3	20	..	1	18	..

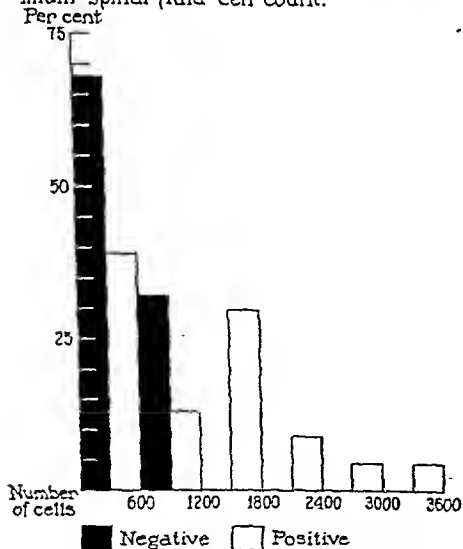
* Detailed records not available for 2 of the 21 negative cases.

gitis will be spoken of as negative. Thus, from the results of the neutralization tests, 29 of 34 cases of aseptic meningitis can be classified as positive or negative in regard to having been caused by the virus of lymphocytic choriomeningitis. Of the 29 cases, 8,

or 28 per cent, were either caused or presumably caused by the virus in question, while, 21, or 72 per cent, were not. Of course one should keep in mind the possibility that an occasional patient infected with the virus may not develop antibodies.

It is of interest to note that W.E., a proved case of lymphocytic choriomeningitis, still possessed neutralizing antibodies against the causative agent 2 years after recovery. On the other hand, W.S., a presumptive case 8 years of age, had, as shown by 2 tests, neutralizing antibodies 6 to 8 weeks after the onset of illness, but no demonstrable protective substances 8 months later.

Chart I
Percentage distribution of 19* negative and 23 positive cases on the basis of the maximum spinal fluid cell count.



* Records of the cell counts for 2 of the 21 negative cases were not available.

ATTEMPTS TO DIFFERENTIATE CLINICALLY THE CASES OF ACUTE ASEPTIC MENINGITIS CAUSED BY THE VIRUS OF LYMPHOCYTIC CHORIOMENINGITIS FROM THOSE NOT SO INDUCED

In the literature 15 positive or presumptive cases of lymphocytic choriomeningitis^{5, 7, 11, 12, 13,* 14, 15, 16, 17} have been described; these include 3 positive cases reported in a preliminary note by

* The tests on the cases reported by Dr. Dominick were done in our laboratory and the results are included in our tables.

TABLE II
Results of Clinical Examinations of 23 Positive Cases

Case	Age	Race and Sex	Month of Onset	Maximum Temp. Recorded	Maximum Cell Count, Spinal Fluid	Per cent Lymphocytes, Spinal Fluid	Test for Syphilis	
							Blood	Spinal Fluid
<i>Proved Lymphocytic Choriomeningitis</i>								
S.B.	8 yrs.	W.M.	Sept.	104.0	1,400	80	..	—
W.E. (5)	31 "	W.M.	Dec.	104.0	1,700	Predominant	—	—
R.E.S. (5)	33 "	W.M.	Dec.	100.2	720	100	—	—
A.W. (12)	46 "	W.M.	Sept.	102.0	330	97	—	—
B.C. (12)	33 "	W.M.	Oct.	100.0	63	..	—	—
Case 4 (7)	20 "	W.F.	Mar.	100.8	409	100	—	—
Wallace S. (16)	33 "	W.M.	Feb.	103.8	304	100	..	—
F.A. (16, 17)	36 "	W.F.	Mar.	100.6	550	90	—	—
L.H. (16)	15 "	B.M.	May	99.6	1,800	98	—	..
<i>Presumptive Lymphocytic Choriomeningitis</i>								
E.H.	8 mos.	W.F.	July	93.6	800	80	..	—
Barb. S.	29 yrs	W.F.	Aug.	100.1	720	100	..	..
William S.	8 "	W.M.	Sept.	101.0	280	100	—	..
M.T. (13)	19 "	W.F.	Oct.	101.0	1,380	100	—	—
C.P. (13)	14 "	W.F.	Oct.	104.0	300	100	—	—
Rose R.	15 "	W.F.	Mar.	100.0	540	100	..	—
And. W.	28 "	B.M.	June	101.0	1,400	95	..	—
Case 1 (7)	19 "	W.F.	May	102.0	3,200	96	..	—
Case 2 (7)	28 "	W.M.	Apr.	101.0	1,260	98	..	—
Case 3 (7)	33 "	W.M.	Oct.	102.0	1,255	100	—	..
W.C.'s pt. (12, 14)	5½"	W.F.	Nov.	99.4	2,155	98	..	..
Adam M. (15)	18 "	W.M.	Oct.	103.0	2,750	100	—	—
P.H. (11)	29 "	W.M.	Nov.	103.6	75	95	..	..
S.M. (11)	30 "	W.F.	Mar.	100.2	1,200	75	..	..

Rivers and Scott¹⁶ which Scott will report in detail later. In addition to these 15 cases we have found 8 others during our recent experimental investigations. Thus, there are 23 cases of acute aseptic meningitis caused by the virus of lymphocytic choriomeningitis that are available for comparison with our 21 cases not induced by the virus in question. Therefore, it seemed of interest to determine whether there is a significant clinical difference between the two groups. The important clinical findings in the two groups are summarized in Tables I-III and in Chart I.

A comparison of the findings in the two groups reveals that a large number of the positive cases gave a history of an influenza-like prodrome, *i.e.*, general malaise, generalized pains, headache,

upper respiratory infection, and fever, 1 to 3 weeks before the onset of meningitis, while from only a few of the negative cases was such a history obtained.

With the onset of meningitis the signs and symptoms in the positive and negative cases were similar and occurred with equal frequency in the two groups. Headache, nausea, vomiting, nuchal rigidity, abnormal deep reflexes, and fever were the usual findings.

A localized neuropathy was observed with approximately equal frequency in the two groups. Four negative cases (L.E., B.'s patient, J.R., and Ben S.) showed a transient facial paralysis, while another one (C.G.) developed a chronic arachnoiditis of the posterior fossa. One positive case (Adam M.) had a transient facial paralysis: an-

TABLE III
Results of Clinical Examinations of 19 * Negative Cases

Case	Age	Race and Sex	Month of Onset	Maximum Temp. Recorded	Maximum Cell Count, Spinal Fluid	Per cent Lymphocytes, Spinal Fluid	Test for Syphilis	
							Blood	Spinal Fluid
Aili M.	32 yrs.	W.F.	Jan.	101.0	604	65	..	—
L.E.	30 "	W.M.	Jan.	102.0	110	100	—	—
R. LeP.	9 "	W.M.	Apr.	103.0	242	100	—	..
J.G.	15 "	W.F.	Dec.	105.0	20	90	..	..
C.G.	57 "	W.M.	Dec.	102.0	450	100	—	—
B.'s patient	32 "	W.M.	Feb.	100.0	607	100	..	—
Salv. M.	15 "	W.M.	Apr.	Slight fever	150	96	..	—
M.B.	16 "	W.F.	Apr.	104.0	940	98	—	—
J.R.	37 "	W.F.	Apr.	101.5	29	100	—	—
A.N.	42 "	W.M.	Sept.	103.0	32	100	—	—
D.H.	6 "	W.F.	Aug.	104.8	346	46	..	..
A.F.	3 "	W.M.	June	102.0	320	94	..	..
F.D.W.	10 "	W.F.	Apr.	102.0	340	60	..	—
Ben S.	30 "	W.M.	June	98.6	220	100	..	..
D.C.	7 "	B.F.	July	103.0	620	95	—	—
Richard R.	5 "	W.M.	July	101.6	80	90	—	—
F.A.L.	15 "	W.M.	July	101.0	1,000	Predominant	—	..
Simone M.	4½"	W.F.	Dec.	Slight fever	134	100	—	..
E.	Young	—M.	Dec.	104.0	672	100	..	..

* Detailed records not available for 2 of the 21 negative cases.

other (R.E.S.) showed transient unilateral sensory changes in the lumbar region; 3 others (A.W., B.C., and F.A.) developed bladder symptoms and muscular weakness and loss of sensation in the lower extremities. One (B.C.) of the last 3 patients mentioned also developed a facial paralysis which was still complete with electrical reaction of degeneration 7 weeks after the onset. The condition of A.W. was improved several months after the onset of the illness; the present condition of the patient has not been recorded. F.A.'s condition did not improve and when she was operated upon 6 months after the onset of her illness a chronic arachnoiditis involving the cord was found.

There were no significant differences in the amounts of protein, sugar, and chloride found in the spinal fluids of the two groups; nor were the hemato-

logical findings of aid in differentiating positive from negative cases. However, a comparison of the cell counts of the spinal fluids in the two groups shows that the positive cases tended to have more cells than did the negative. For example, 48 per cent of the positive cases at some time during the acute stage had more than 1,200 cells per c.mm., while this was true of none of the negative cases (Chart I).

There was no significant difference in the age of patients in the positive or negative groups. Furthermore, 10 of the 23 positive cases were in patients under 20 years of age, the 2 youngest being 5½ years and 8 months old respectively, a finding somewhat different from that reported by Armstrong and Wooley⁸ and Wooley, Armstrong, and Onstott,¹¹ who, in view of their investigations, are inclined to believe that obvious infection with the virus of

lymphocytic choriomeningitis is relatively infrequent in infants and children.

COMMENTS AND SUMMARY

From the evidence presented in this paper it is obvious that all cases of acute aseptic meningitis (Wallgren) are not caused by the virus of lymphocytic choriomeningitis. The etiological agent or agents responsible for the cases not so induced are not known. Furthermore, from the records^{12, 17} of 3 patients with lymphocytic choriomeningitis it appears that certain cases of the disease, because of the extent of paralysis and sequelae, do not satisfy the criteria laid down by Wallgren for the diagnosis of acute aseptic meningitis.

It is difficult or impossible to differentiate by clinical means alone the cases of acute aseptic meningitis caused by the virus of lymphocytic choriomeningitis from those not produced by the agent; however, the spinal fluid cell counts in the cases studied tend to be higher in the former group than in the latter.

Children and even infants are not infrequently attacked by the virus of lymphocytic choriomeningitis.

REFERENCES

1. Armstrong, C., and Lillie, R. D. Experimental Lymphocytic Choriomeningitis of Monkeys and Mice Produced by a Virus Encountered in Studies of the

1933 St. Louis Encephalitis Epidemic. *Pub. Health Rep.*, 49:1019 (Aug.), 1934.

2. Traub, E. A Filterable Virus Recovered from White Mice. *Science*, 81:298 (Mar.), 1935.

3. Rivers, T. M., and Scott, T. F. McN. Meningitis in Man Caused by a Filterable Virus. *Science*, 81:439 (May), 1935.

4. Wallgren, A. Une nouvelle maladie infectieuse du système nerveux central? *Acta Paediat.*, 4:158 (Apr.), 1925.

5. Scott, T. F. McN., and Rivers, T. M. Meningitis in Man Caused by a Filterable Virus. I. Two Cases and the Method of Obtaining a Virus from Their Spinal Fluids. *J. Exper. Med.*, 63:397 (Mar.), 1936.

6. Rivers, T. M., and Scott, T. F. McN. Meningitis in Man Caused by a Filterable Virus. II. Identification of the Etiological Agent. *J. Exper. Med.*, 63:415 (Mar.), 1936.

7. Armstrong, C., and Dickens, P. F. Benign Lymphocytic Choriomeningitis (Acute Aseptic Meningitis). *Pub. Health Rep.*, 50:831 (June), 1935.

8. Armstrong, C., and Wooley, J. G. Benign Lymphocytic Choriomeningitis. *J.A.M.A.*, 109:410 (Aug.), 1937.

9. Reimann, H. A. Infectious Diseases, Review of Current Literature. *Arch. Int. Med.*, 60:337 (Aug.), 1937.

10. Lepine, P., Mollaret, P., and Kreis, B. Réceptivité de l'homme au virus murin de la choriomeningite lymphocytaire. Reproduction expérimentale de la méningite lymphocytaire bénigne. *Comptes. rend. Acad. d. Sc.*, 204:1846 (June), 1937.

11. Wooley, J. G., Armstrong, C., and Onstott, R. H. The Occurrence in the Sera of Man and Monkeys of Protective Antibodies Against the Virus of Lymphocytic Choriomeningitis as Determined by the Serum-Virus Protection Test in Mice. *Pub. Health Rep.*, 52:1105 (Aug.), 1937.

12. Findlay, G. M., Alcock, N. S., and Stern, R. O. The Virus Aetiology of One Form of Lymphocytic Meningitis. *Lancet*, 1:650 (Mar.), 1936.

13. Dominick, DeW. Lymphocytic Choriomeningitis. *J.A.M.A.*, 109:247 (July), 1937.

14. Collis, W. R. F. Acute Benign Lymphocytic Meningitis (Acute Aseptic Meningitis). *Brit. M. J.*, 2:1148 (Dec.), 1935.

15. Viets, H. R., and Warren, S. Acute Lymphocytic Meningitis. *J.A.M.A.*, 108:357 (Jan.), 1937.

16. Rivers, T. M., and Scott, T. F. McN. Five Cases of Lymphocytic Choriomeningitis in Man. *Trans. Am. Paediat. Soc.*, 48:41 (June), 1936.

17. Barker, L. F., and Ford, F. R. Chronic Arachnoiditis Obliterating the Spinal Subarachnoid Space. *J.A.M.A.*, 109:785 (Sept.), 1937.

Difficulties Encountered in Pneumococcal Type Determination*

ANNABEL W. WALTER

Bureau of Laboratories, Department of Health, New York, N. Y.

WITH the increasing availability of therapeutic serum for use in the treatment of pneumococcus pneumonia, rapid and reliable determination of the type of infecting organism is being demanded by more and more physicians. Sera for treating some of the types of pneumococci that occur less frequently will probably be produced in the near future, with the result that more laboratories will find it necessary to test not only for Types I, II, and III, but also for all other types for which therapeutic serum may be available. A number of methods of type determination have been presented.¹⁻¹⁸ Certain difficulties have arisen with each, and it is of some of these as we have experienced them that we propose to speak. No claim of originality is made for our methods; most of them were developed under the direction of the late Georgia Cooper whose devotion and application to the laboratory phases of the pneumonia problem resulted in many advances in type differentiation and serum production. My appreciation is also due Kathryn Blount and the other members of the present staff whose coöperation and interest have made it possible to accomplish a steadily increasing amount of work.

We have tried to group the difficul-

ties according to their sources: in the specimen, the sera used for testing, the methods, and the equipment.

Specimen—Sputa, swabs from the throat, gastric contents,¹⁹ cultures, pus, spinal fluids, pleural fluids may all be used for type determination.

Sputum should be fresh. The ideal age for the Neufeld reaction is less than an hour. If such rapid transportation from the patient to the laboratory is not feasible, the specimen should be kept in the icebox until it can be sent in, to delay as much as possible the overgrowth of organisms other than pneumococci. Some physicians have the impression that a fairly large amount of sputum is necessary, and will continue to collect the patient's expectorations over 12 to 24 hours. As small a volume as $\frac{1}{4}$ c.c. is usually enough for the Neufeld reaction, for a culture on a blood agar plate and, if necessary, for inoculation in a mouse.

The sputum should be collected in a clean, dry and preferably sterile container with no disinfectant. We prefer a clear glass wide-mouth bottle about $1\frac{3}{4}$ " wide and $2\frac{1}{2}$ " high with a screw cap. The wide mouth is more convenient for the patient. Clear glass makes it easier to determine the consistency and color of the specimen and facilitates the removal of such more promising portions as bloody or mucoid flecks to a Petri dish for examination.

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

The bottle supplied in New York City for sputa to be examined for tubercle bacilli contains a liquid disinfectant which will dilute a thin watery specimen so much that the task of finding organisms when the Neufeld reaction is employed is almost impossible. Some disinfectants also have an inhibitory effect on the capsular swelling and, unless the specimen is very thick, will kill all the organisms so that attempts to cultivate them either by mouse inoculation or on artificial media are futile. The removal of sputum from the container to a Petri dish is easy if a 2 c.c. rubber bulb on a glass tube about 3" by 5/16" with a blunt point is used. In collecting sputum, care should be taken to make sure that the sample is actually pulmonary exudate raised by coughing, not retro-pharyngeal mucus or saliva.

In cases where sputum is not produced, as in infants and small children, suitable material for typing may be obtained by gently touching the pharynx with a sterile cotton swab on a long applicator to induce a cough and collecting on the swab any mucus produced.¹⁰ The swab is then sent in a dry, sterile tube to the laboratory where it is twirled thoroughly in 1/2 c.c. of serum broth in order to remove the sputum, and then rolled against a dry part of the tube to squeeze out as much of the suspension as possible. If the pneumococci are too few for typing by the Neufeld reaction, they may be concentrated by centrifugation at a fairly high speed for 20 to 30 minutes and then resuspended in one or two drops of the supernatant fluid. We have obtained very good results with such material both by the Neufeld method and by mouse inoculation.

When blood cultures are made, it is essential the blood be added to suitable broth and mixed thoroughly to prevent clot formation as soon as it is

drawn, and that the culture be either incubated immediately or stored at a temperature between 8 and 15° C. until it can be incubated. Broth cultures should be observed at intervals for growth, which may occur in from 12 hours to 3 days. When growth occurs, the type may be determined by the Neufeld reaction. Care should be taken that too much blood is not used; up to 2 c.c. for 50 c.c. of broth, or 1 c.c. for 25 c.c. of broth, is adequate. Much more prognostic value is attached to blood cultures made in poured agar plates from which the degree of bacteremia may be estimated and followed.

For growing pneumococci, it is essential that the medium used will support growth but will not cause rapid autolysis. We have found beef-heart broth and agar containing 0.2 per cent disodium phosphate as a buffer and with no sugar added very satisfactory. Directions for their preparation as carried out in this laboratory are given here in full because of the many requests we have had for details.

Soak chopped beef heart from which fat has been removed in tap water in the proportion 1 lb. to 1 liter overnight in the refrigerator. Boil until meat clumps and turns brown. Strain through cheese cloth. Test for carbohydrates. Good broth contains 1.2–1.5 mg. of total carbohydrate per c.c. Add 1.0 per cent Parke-Davis peptone and 0.2 per cent disodium phosphate. Dissolve by boiling with broth. Adjust reaction to pH 8.1 with sodium hydroxide. While the reaction is being adjusted, keep broth at boiling point to bring down precipitate. Final reaction should be pH 7.4–7.7. Filter through paper while hot. (Cotton is sometimes placed below paper to keep it from breaking.) Tube or bottle and sterilize in autoclave at 15 lb. pressure for 1/2 hour.

Test for support of growth by inoculating several tubes with 0.2 c.c. of the supernatant growth of blood broth cultures of several types of pneumococci (we use Types I, II, III, V, IX). Compare density of growth at 18 hours with known turbidity standards such as meningococcus standards. Determine pH of 18 hour growth. Broths whose pH fall below 6.8 as a result of digestion by the

organisms of the sugar in the media are unsatisfactory because pneumococci are injured by an excess of acid.

For media for maintenance of stock cultures, 3 per cent horse blood (citrate)* is added to the broth a few days before it is to be used.

The same stock may be used for agar medium.

Spinal fluids from pneumococcic meningitis should be examined as soon as possible. The organisms can be typed by the Neufeld reaction. If they are few, they may be concentrated by centrifugation or cultured in blood broth. Since only one type of pneumococcus is usually found in spinal fluids, a search for a possible mixed infection is not indicated.

Pus from ear infections or from peritonitis often contains many intracellular organisms. Dilution with broth may facilitate typing by the Neufeld reaction or cultures in blood broth may be made and typed when growth occurs.

Fluid aspirated by means of a syringe from the lung is usually too small in quantity for direct examination and requires cultivation in broth.²¹

Serum—For microscopic and macroscopic agglutination and precipitation tests, antisera produced in horses are employed. Each serum should be tested before use to determine its titer with the homologous strain and the degree of cross-reaction with all other types of pneumococci. Those sera which give a strong reaction with the homologous strain in a dilution which excludes cross-reactions (preferably 1-5 to 1-20) are most suitable. The dilution recommended should be indicated on the label of each vial. Sera produced in horses are not satisfactory for the Neufeld reaction.

For the capsular swelling reaction, antisera produced in rabbits are used. We have set an arbitrary agglutinin

titer of 1-200 for our rabbit sera but the swelling titer may also be used as a criterion for adequate strength. Such sera should have a swelling titer of at least 1 to 15 to permit them to be combined in groups of at least 5 types and still have sufficient excess antibody present that reactions may be obtained with sputa containing many pneumococci or large amounts of soluble specific substance from autolysis. Each serum should be tested for cross-reactions with all other types of pneumococci. Sera which react nonspecifically should not be issued. We have found it more satisfactory to add methylene blue as the preparations are set up than to add it to the rabbit serum in bulk.

Aging in the cold does not cause appreciable deterioration of either horse or rabbit serum. Although the specific titer drops slightly within the first year, nonspecific reactions become less the longer the serum is kept.

Method—In our hands, the Neufeld reaction has proved to be the most rapid and reliable method of pneumococcal type determination. The technic we use has been published previously but I quote it here.

Part of the sputum is placed in a Petri dish. The remainder is stored in the icebox until all tests are completed. "With a tiny loop or a straight wire place a very small amount of material on a cover glass, mix with 4 to 40 times the amount of serum as required and a standard loopful (0.01 c.c.) of Loeffler's methylene blue. Seal on a hollow-ground slide with cedar oil, place a drop of oil on the cover glass and examine with the oil immersion lens. Inverting the slides with the ends on side rests, and cover glasses down for a short time before examination seems to facilitate the examination, especially when the specimen is thin. The heavier elements, including the pneumococci, settle on the cover glass and may be more easily examined. A fairly good microscope is necessary and a powerful microscope light is a great aid. When only ordinary light is available the drops may be placed on flat slides and covered with cover glasses. When

* 1 per cent citrate (10 per cent citrate added—1 part in 10).

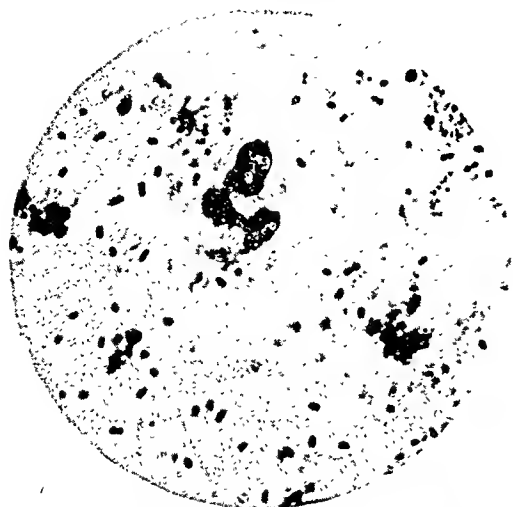


CHART I—Pneumococci with normal capsules.
No reaction

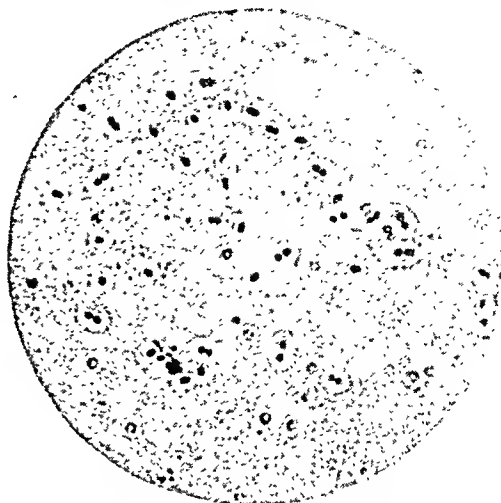


CHART II—Pneumococci with capsules
swollen. Positive reaction

the organisms are few they were somewhat more difficult to find in thin preparations."¹⁷

The procedure is to observe the reaction with 6 combinations of 4 to 6 antisera among Types I to XXXII²² are divided. When we started using combinations 5 years ago, we made groups of as many as 12 sera,¹⁷ but have since found that some sera may be too weak for consistent results in so great a dilution. If no reaction is observed immediately, we examine the preparations again after an hour or so.

The criticism we hear most often of the Neufeld method is "there are plenty of organisms but they do not react." Usually the failure to obtain a reaction may be traced to the relative amounts of sputum and serum used. Consistent results cannot be obtained by using equal parts of sputum and serum. It is unfortunately misleading that positive reactions do sometimes occur with such proportions. In order to be sure to have an excess of serum present, we use two separate loops of 28 gauge platinum wire—a very small one, 1 mm. in diameter, for placing the fleck of sputum on the cover-glass, and a larger one, 4 mm. in diameter, for the serum and the methylene blue. A straight wire may be used for

mucoid specimens loaded with organisms. From 4 to 10 times as much monovalent serum as sputum, and from 10 to 40 times as much combined serum as sputum seem to be satisfactory proportions for specimens containing moderate to large numbers of pneumococci. It is advisable to examine the first preparation made immediately to see if there are enough organisms present. With specimens containing very few, larger amounts of sputum will necessarily be required. The identity of organisms which resemble pneumococci in the hanging drop, but fail to react with any of the sera available, can only be determined by cultural examination.

It sometimes happens that a small amount of sputum collected in a paper container or one that is not air-tight will reach the laboratory nearly dried up. Broth may be added to resuspend such material. Another extreme is met more often: the specimen is extremely tenacious and very thick. When preparations made by mixing with serum are examined microscopically, large masses of material are seen in which organisms that do not react are noted. There is reason to believe the serum has not reached the organisms because of the nature of the sputum.

With such material, it is well worth while to try the technic proposed by Kohl²³: a small amount of sputum is thoroughly mixed with about 5 c.c. of saline (0.85 per cent) or broth in a Petri dish. The flecks that float to the top are used for the Neufeld reaction. These preparations are very easy to examine because of the extreme clarity of the field.

When the specimen is thin some strains, especially Type III, show a marked tendency to be agglutinated by the specific serum. Large clumps of organisms are formed with the swollen capsules distinguishable only around the edge of the masses. As few organisms remain isolated in such preparations a thorough examination must be made lest they be overlooked entirely.

A small proportion of sputa will be found to contain two or more types of pneumococci. For this reason, it is not enough to find a positive reaction. One must be sure there is no reaction with any of the other diagnostic sera being used. If more than one type is found, some indication as to which is the causative agent may be obtained from the relative proportion of the different organisms present and from a knowledge of the incidence of the different types of pneumococci in healthy individuals. For example, types III, VIa & b, and XXIII are relatively more common in normal throats than are other types. Examination of a second specimen from the same case may reveal the presence of only one type.

If hanging drop preparations are made, the slides and cover-glasses must be thin. Slides less than 1.5 mm. in thickness and No. 1 cover-glasses allow enough working distance for focusing to the bottom of the drop. Cedar oil is supplied in different grades of viscosity. A medium weight is the best for year-round use.

There are disadvantages as well as

advantages in the use of flat slide preparations for the Neufeld reaction. Among the advantages, is ease in setting up the preparations. Plain slides are uniformly thinner than hollow-ground ones, so adequate working distance is assured. A less powerful microscope lamp is required. Focusing is easier too, with only one plane to be examined. There are three chief disadvantages: first, it is a difficult and time consuming task to seal flat slide preparations so they may be reexamined after an hour or so. As the drops dry around the edge, the organisms take on an appearance that may be mistaken for a swelling. The second disadvantage is that large drops of mixed sputum and serum are apt to seep out around the edges of the cover-glass and contaminate both the fingers of the operator and the lens. The third and most serious objection is that sputa that are very tenacious or that contain solid particles prevent the cover-glass from lying flat on the slide. When an attempt is made to focus on such a preparation, the cover-glass may move up and down with the lens in a very disturbing manner.

Specimens which fail to type by the Neufeld reaction may be examined further by the intraperitoneal inoculation of $\frac{1}{4}$ c.c. into a mouse which is observed at frequent intervals for signs of sickness. Symptoms may occur in 4 or 5 hours. At that time or in 18 or 24 hours, a puncture of the peritoneum is made. For this purpose, we use a capillary tube about 75 mm. long and 1 mm. in diameter drawn to a sharp point. The point is inserted into the peritoneum and a small amount of fluid is drawn out. The fluid will flow more readily if the mouse is held with the abdomen down. A small rubber bulb may be used to exert suction if necessary. The material obtained is examined by the Neufeld reaction, care

being taken that only minute amounts of exudate are used. Mice which show no organisms on puncture and continue in good health are killed at the end of 5 days. If the mouse dies or is sick enough to be killed, the peritoneum is opened and the exudate placed on the cover-glasses with a straight wire. Cultures are made in blood broth and on blood agar plates from the exudate and also from the heart's blood.

We have found the Neufeld reaction much more satisfactory than the stained slide agglutination technic or macroscopic agglutination and precipitation methods for examining peritoneal exudate, chiefly because of the absence in rabbit sera of the cross-reactions that occur to some degree in nearly all horse sera.

The extreme susceptibility of the mouse to pneumococci may lead to errors in typing. It succumbs so readily to most strains that if more than one type of organism is present, death from the more virulent type will usually occur so promptly that the presence of the other type will not be detected.

For example: a few Type III organisms from the throat of a patient whose sputum contains a moderate number of pneumococci of some other type will almost always cause death from Type III septicemia of a mouse inoculated with such material. If the mouse test only is used for typing, the other organism will be overlooked. An attempt to hold back a virulent type in a mouse if the presence of a less virulent type is suspected may be made by injecting an appropriate amount of serum for the virulent type along with the sputum.²⁴

As a routine procedure, we culture each specimen received on a fresh blood agar plate in such a manner as to produce separate colonies.

A moderate amount of material on a platinum loop is streaked back and forth 10 or 15 times without lifting the loop from the surface. The loop is sterilized by heat and an equal number of streaks are made at right angles. This technic will almost al-

ways result in isolated colonies over the entire surface of the plate. The presence of hemolytic colonies may be detected more easily if a cut is made with a straight wire part way through the agar from the beginning of the streak diagonally across the plate.

The plate is incubated for 18 to 24 hours and the approximate percentages of the different types of colonies are recorded. Fishings to blood broth are made of green-producing colonies, at least one of each type observed, and are checked by the Neufeld reaction. If they do not react, bile-solubility tests are carried out to determine whether they are pneumococcus or streptococcus viridans. The technic we use is as follows:

Transplants are made from fresh blood-broth cultures to plain broth using 0.2 c.c. of the supernatant growth as an inoculum. After incubation for 18 to 24 hours, 0.2 c.c. of each culture is combined with 0.1 c.c. of ox-bile in a small tube ($3 \times \frac{3}{8}$ "). Similar amounts of culture are combined also with 0.1 c.c. of broth as controls. Cultures which produce a granular or flocculent sediment are mixed well before use. As a guide to the clarity and color to be expected, one tube containing 0.2 c.c. broth and 0.1 c.c. bile is included. The tubes are incubated in a water bath at 45° C. for 1 hour and then examined. Those cultures which lyse completely in bile are considered soluble, and therefore pneumococci. The bile used must necessarily be crystal-clear. Centrifugation may be enough to clarify it but sometimes filtration is necessary. Each new lot of bile should be tested with known pneumococcus and streptococcus viridans cultures.

We also make a fairly thick smear of each sputum which we stain by Gram's method. This is not of much value in deciding whether or not pneumococci are in the specimen but the presence of numerous Gram-negative bacilli or Gram-positive cocci in bunches may be of interest to the physician.

From about 20 per cent of the 367 sputa we examined last winter (November 1, 1936—April 30, 1937), no indication as to the organism causing

the disease could be obtained by the methods described above.

Equipment—Adequate lighting for microscopic examination for the Neufeld reaction is most important. A fairly good microscope is necessary and an inclined binocular is certainly easier on the examiner. Sufficient light is absolutely essential. We use high power lamps equipped with 500 watt bulbs. There are, however, other lamps equipped with 100 or 200 watt bulbs on the market which should be satisfactory and less expensive to operate.

Hollow ground slides and cover-glasses of proper thickness and two platinum loops of different sizes will speed up the examinations.

SUMMARY

Specimens for pneumococcal type determination should be fresh and should contain no disinfectant.

Labels on vials of diagnostic horse serum should indicate the dilutions best suited for macroscopic and microscopic agglutination as determined by tests with all types of pneumococci. Rabbit serum for the Neufeld reaction should be tested with all types and only specific serum should be issued.

The Neufeld reaction is the most rapid and reliable method for typing. The proper proportions of serum and sputum must be used for consistent results.

Mouse inoculation may be employed if no reaction is obtained on direct examination. Peritoneal exudate may best be typed by the Neufeld method, care being taken that very small amounts of material are used.

Cultural examination will show the relative proportions of different organisms present.

An adequate lighting system for the Neufeld reaction is essential.

REFERENCES

1. Neufeld, F. Ueber die Agglutination der Pneumokokken und Ueber die Theorien der Agglutination. *Ztschr. f. Hyg.*, 40:54-72, 1902.
2. Blake, F. G. Methods for the Determination of Pneumococcus Types. *J. Exper. Med.*, 26:67-80, 1917.
3. Avery, O. T., Chickering, H. T., Cole, Rufus, and Docbeez, A. R. *Acute Lobar Pneumonia*. Rockefeller Institute for Medical Research Monograph 7, Oct. 16, 1917.
4. Avery, O. T. Determination of Types of Pneumococcus in Lobar Pneumonia: A Rapid Cultural Method. *J.A.M.A.*, 70:17-19, 1918.
5. Krumwiede, Charles, and Valentine, E. Determination of the Type of Pneumococcus in the Sputum of Lobar Pneumonia. *J.A.M.A.*, 70:513-514, 1918.
6. Oliver, Wade W. A Rapid Method of Pneumococcus Typing. *J. Infect. Dis.*, 27:310-314, 1920.
7. Rosenthal, L., and Sternberg, B. A Rapid Method for Determining the Type of Pneumococcus in Sputum. *J. Lab. & Clin. Med.*, 15:78-81, 1929.
8. Sabin, A. B. The Microscopic Agglutination Test in Pneumonia. *J. Infect. Dis.*, 46:469-484, 1930.
9. Neufeld, F., and Etinger-Tulczynska, G. Nasale Pneumokokkeninfektionen und Pneumokokkenkeimtr  ber im Tierversuch. *Ztschr. f. Hyg. u. Infektionskrankh.*, 112:492-526, 1931.
10. Calder, R. M. A Microscopic Method of Typing Pneumococci by the Use of Stained Organisms. *J.A.M.A.*, 97:698-700, 1931.
11. Armstrong, R. R. Immediate Pneumococcal Typing. *Brit. M. J.*, 1:187-188, 1932.
12. Logan, W. R., and Smeall, J. T. A Direct Method of Typing Pneumococci. *Brit. M. J.*, 1:188-189, 1932.
13. Valentine, F. C. O. A Staining Method for the Direct Typing of Pneumococci. *Lancet*, 1:22 (Jan.), 1933.
14. Etinger-Tulczynska, R. Bakterienkapseln und "Quellungsreaktion." *Ztschr. f. Hyg. und Infektionskrankh.*, 114: 769-789, 1933.
15. Sabin, A. B. Immediate Pneumococcus Typing Directly from Sputum by the Neufeld Reaction. *J.A.M.A.*, 100:1584-1586 (May 20), 1933.
16. Beckler, E., and MacLeod, P. The Neufeld Method of Pneumococcus Type Determination as Carried Out in a Public Health Laboratory: A Study of 760 Typings. *J. Clin. Investigation*, 13: 901-907, 1934.
17. Cooper, G., and Walter, A. Application of the Neufeld Reaction to the Identification of Types of Pneumococci with the Use of Antisera for Thirty-Two Types. *A.J.P.H.*, 25:469-474, 1935.
18. Klein, S. J., and Heller, G. New Rapid Method for Direct Typing of Pneumococcus in Sputum of Pneumonia Cases. *Proc. Soc. Exper. Biol. & Med.*, 34:488-490 (May), 1936.
19. Wittes, S. A., and Bullowa, J. G. M. Gastric Aspiration in Children with Pneumonia to Obtain Material for Pneumococcus Typing. *Am. J. Dis. Child.*, 50:1404-1407, 1935.
20. Vinograd, J., Nemir, R. L., and Park, W. H. Rapid Typing by Neufeld Reaction Directly from Laryngeal Swabs from Infants and Children. *Am. J. Dis. Child.*, 51:792-800 (Apr.), 1936.
21. Bullowa, J. G. M. Reliability of Sputum Typing and Its Relation to Serum Therapy. *J.A.M.A.*, 105:1512-1518, 1935.
22. Cooper, G., Rosenstein, C., Walter, A., and Peizer, L. The Further Separation of Types Among the Pneumococci Hitherto Included in Group IV and the Development of Therapeutic Antisera for These Types. *J. Exper. Med.*, 55:531-554 (Apr.), 1932.
23. Kohl, C., and Reitzel, R. J. Type Specificity in Pneumonia and Pneumococcal Infections. *J.A.M.A.*, 106:1557-1561, 1936.
24. Griffith, F. The Significance of Pneumococcal Types. *J. Hyg.*, 27:113-159 (Jan.), 1928.

Alpha Hemolytic Streptococci of Air*

Their Variant Forms, Origin and Numbers per Cubic Foot of Air in Several Types of Locations

LEON BUCHBINDER, PH.D., MATHILDE SOLOWEY, AND
MORRIS SOLOTOROVSKY

DeLamar Institute of Public Health, College of Physicians and Surgeons, Columbia University †; and W.P.A. Air Pollution Survey, Department of Health, New York, N. Y.

THIS is the second report on the study of bacteria in the air of several types of locations in New York City. The first, a brief preliminary note,¹ was read before this section in 1936.

The previous report summarized the findings as to average numbers of total bacteria and of alpha and beta streptococci, in 6 types of locations, during the first 16 weeks of the study. The present paper continues and elaborates the analysis of the findings, as to alpha streptococci, only, for an entire calendar year. The probable origin of the alpha streptococci found is also discussed, as well as the appearance, numerical frequency, and possible significance of certain variant forms.

THE NUMBER OF ALPHA STREPTOCOCCI IN THE AIR AT THE SEVERAL TYPES OF LOCATIONS

A total of 2,517 samples of air were examined by means of the Wells Air Centrifuge in sheep's blood agar cultures for the presence of alpha hemolytic streptococci. The samples were from sources distributed as follows: 6 schools, 46 per cent, the cars of a subway, 20 per cent, and 6 theatres, 6 streets, and a park, 34 per cent. The findings are presented in Table I.

Table I indicates that more streptococci were found in schools than in any other location, as evidenced both by the total number per cu. ft. and the percentage of positive samples. The subway was a close second in number of positive samples obtained, but the average number of streptococci for all samples in the subway was proportionately lower. Streets, non-air conditioned theatres, air-conditioned theatres, and the park followed in decreasing order as indicated.

The findings in the 6 schools are analyzed further in Table II according

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

† Supported by a grant from the John B. Pierce Foundation.

NOTE: Most of the laboratory studies reported herein, were performed at the DeLamar Institute, while the routine collection of air samples was made by the Air Pollution Survey, a W.P.A. project sponsored by the Department of Health.

TABLE I

Alpha Hemolytic Streptococci per Cu. Ft. of Air at Several Types of Locations in New York City Studied for a Period of One Year

(Samples on Sheep's Blood Agar)

Location	No. of Samples	No. Cu. Ft. of Air Sampled	No. of Strep. Isolated	Av. No. Strep. per Cu. Ft. Air All Samples	Per cent Positive Samples	Av. No. Strep. per Cu. Ft. Air Positive Samples Only
All	2,517	36,080	4,015	0.08	48	0.16
Schools	1,164	17,232	2,511	0.15	68	0.22
Subway	491	6,761	657	0.10	62	0.15
Streets	310	4,468	443	0.10	54	0.18
Non-Air						
Conditioned						
Theatres	130	2,032	158	0.08	48	0.15
Air						
Conditioned						
Theatres	293	4,058	195	0.05	32	0.15
Central Park	129	1,529	51	0.03	25	0.14

to the individual school sampled. The first point of interest is that the schools fall into two distinct groups. Schools numbers 1 to 3 have higher average numbers of streptococci per cu. ft. of air for all samples and for positive samples, as well as a greater percentage of positive samples, than do schools 4 to 6.

Schools 1 and 2 are 2 of the oldest in the city and are in the lower east side. They are of definitely inferior construction, contain small rooms, and are difficult to keep clean, number 1

being the poorer of the 2. It may also be of interest that the children are of the lowest economic group in the city, and come from a health area which shows a high incidence of reportable communicable disease. Schools 5 and 6, the 2 high schools in the group, are located in the upper middle west side. While of more modern construction than the first 2 schools they cannot be called new. They are of more suitable design than the former, however, since they have large rooms, large windows, and high ceilings. These

TABLE II

Alpha Hemolytic Streptococci per Cu. Ft. of Air at Six Schools in New York City Studied for a Period of One Year

(Sampled on Sheep's Blood Agar)

All Types of Rooms

School No.	No. Samples	Per cent Positive	No. Cu. Ft. Air Sampled	No. Strep. Isolated	Av. No. Strep. per Cu. Ft. Air		Av. No. per Positive Sample
					All Samples	Pos. Samples	
All Schools *	194	68	2,872	418	0.15	0.22	3.2
1	180	82	2,128	554	0.26	0.32	3.7
2	194	77	2,893	567	0.19	0.21	3.8
3	186	74	3,000	480	0.16	0.22	3.5
4	209	57	3,208	343	0.11	0.19	2.9
5	199	58	3,049	285	0.09	0.16	2.5
6	196	60	2,954	282	0.09	0.16	2.4

* Averages

2 high schools can be rated as the best in the group in general appearance. School 6, moreover, is the only one of the 6 which uses a mechanical system of ventilation. Schools 3 and 4, in the upper east side, are of about the same age as the 2 high schools, but their type of construction is less modern. School 4 has better facilities for natural ventilation and appears to be somewhat cleaner than school 3. The pupils of school 4 are derived from a higher economic group than those of the other 5 schools.

Three types of enclosed spaces have been sampled in each school—classrooms; assembly rooms such as playrooms, lunch rooms and gymnasias; and corridors. The classrooms were tested while they were occupied, within 1 hour after they had been vacated ("Just Vacated") and after longer periods of vacancy ("Vacant"). The assembly rooms were studied both occupied and vacant. The findings are listed in Table III. The values for the average number of streptococci per positive sample for all schools indicate

that occupied assembly rooms had most alpha streptococci, followed by occupied classrooms, corridors, just vacated classrooms, vacant assembly rooms, and vacant classrooms in the order named. The sequence of percentage of positive samples is practically identical. When the findings for each school are examined separately the differences between the two groups of schools noted above (1 to 3 and 4 to 6) hold almost constant throughout the 6 conditions.

THE ORIGIN OF ALPHA STREPTOCOCCI OF AIR

In an attempt to determine the origin of air streptococci more than 2,000 strains of alpha streptococci have been studied in detail. All cultures were classified into the 8 species of the Holman system and in addition were examined for their microscopic morphology and their effect on litmus milk.

The results indicate that the probable origin of most of the air streptococci is the human throat.

Results—The distribution in the Holman system of cultures from the

TABLE III

Alpha Hemolytic Streptococci per Cu. Ft. of Air in Several Types of Rooms at Six Schools in New York City Studied for a Period of One Year

(Sampled on Sheep's Blood Agar)

School No.	Occupied Classrooms			Just Vacated Classrooms			Vacant Classrooms			Corridors			Occupied Assembly Rooms			Vacant Assembly Rooms		
	No. Samples	% Samples Positive	Av. No. Strept. per Positive Sample	No. Samples	% Samples Positive	Av. No. Strept. per Positive Sample	No. Samples	% Samples Positive	Av. No. Strept. per Positive Sample	No. Samples	% Samples Positive	Av. No. Strept. per Positive Sample	No. Samples	% Samples Positive	Av. No. Strept. per Positive Sample	No. Samples	% Samples Positive	Av. No. Strept. per Positive Sample
All Schools *	87	71	3.3	48	66	3.2	19	53	2.1	12	74	3.3	16	75	3.7	13	59	2.9
1	73	78	3.5	37	78	3.8	11	64	2.6	21	86	3.8	26	100	4.6	12	92	3.7
2	81	83	4.1	50	74	3.3	10	30	1.0	13	93	3.4	24	83	3.8	16	69	4.4
3	98	83	3.5	56	70	3.8	8	63	2.0	8	75	4.5	3	67	3.0	13	39	1.4
4	95	66	3.0	50	50	3.0	16	31	2.8	10	60	1.8	24	54	2.8	14	64	2.2
5	92	61	2.8	50	68	2.3	30	47	1.8	10	63	2.7	4	75	1.7	13	39	1.8
6	86	58	2.5	43	60	2.8	37	68	2.0	8	74	2.4	14	50	2.4	8	50	1.2

* Averages

TABLE IV

The Origin of 1,949 Cultures of Alpha Streptococci Isolated from the Air at Several Types of Locations and Identified by the Holman System of Classification

Location	<i>Str. Salivarius</i>		<i>Str. Mitis</i>		<i>Str. Ignavus</i>		<i>Str. Salivarius</i> *		<i>Str. Equinus</i>		<i>Str. Fecalis</i>		<i>Str. Non-Hemolyticus</i> I, II, III		Totals
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
All	1,136	58.4	317	16.3	167	8.6	1,620	83.2	189	9.7	87	4.4	53	2.7	1,949
Schools	828	64.4	200	15.5	85	6.6	1,113	86.5	93	7.2	45	3.5	35	1.9	1,286
Subway	142	55.7	50	19.6	23	9.0	215	84.3	22	8.6	17	6.7	1	0.4	255
Theatres	90	59.6	24	15.9	18	11.9	132	87.4	11	7.3	5	3.3	3	2.1	151
Streets	66	28.4	40	17.2	33	14.2	139	59.7	60	25.7	20	8.6	14	6.5	233
Park	10	41.7	3	12.5	8	33.3	21	87.5	3	12.5	0	0.0	0	0.0	24

* *Str. salivarius* of Safford, Sherman, and Hodge *

several types of locations is given by both total numbers and percentages in Table IV. It is noted that 83.2 per cent of cultures from all locations fall into the 3 species—*salivarius*, *mitis* and *ignavus*—whose presumable origin is the human nasopharynx. Likewise 9.7 per cent are *equinus* and 4.4 per cent *fecalis*, while the remaining 2.7 per cent are classified by their sugar fermentations in the 3 so-called non-hemolytic species although they all produce greening on agar. When the figures are further analyzed by the 5 types of locations sampled, it is seen that the percentage of throat strains at each type of location except streets varies between 84.3 and 87.5. The high figure for the park is probably not significant, since only 24 cultures were included. The percentage of 59.7 for street cultures, although less than that

for the other types of locations, as was to be expected, is still relatively high, in fact greater than the combined figures for *equinus* and *fecalis* (34.3 per cent). Nevertheless, if the lower percentage of streptococci of presumably nasopharyngeal origin obtained from streets is applied to the data on total counts in Table I, streets drop from 2nd or 3rd to 5th place in order of relative importance, the park alone being lower.

As was to be expected the percentage of *equinus* cultures in streets was higher (25.7) than that at any other location. The next greatest was park (9.7) and the lowest schools and theatres (7.3).

A check on the identification of strains is provided by their reaction on litmus milk as given in Table V. Only 11.5 per cent of the *salivarius* cultures

TABLE V

The Effect of Air Streptococci of Throat and Fecal Origin on Litmus Milk

	Number of Cultures			Percentage of Cultures		
	Acid and Coagulation	Acid	No. Acid	Acid and Coagulation	Acid	No. Acid
<i>Str. Salivarius</i>	440	683	13	38.7	60.1	1.1
<i>Str. Mitis</i>	116	156	45	36.6	49.2	14.2
<i>Str. Ignavus</i>	3	35	129	1.8	21.0	77.2
<i>Str. Salivarius</i> *	559	874	187	34.5	53.9	11.5
<i>Str. Equinus</i>	0	8	181	0.0	4.3	95.7
<i>Str. Fecalis</i>	29	57	1	33.3	65.5	1.2

* *Salivarius* of Safford, Sherman and Hodge *

(Safford, Sherman and Hodge²) failed to produce acid; 77 per cent of these were cultures (*ignavus*) which do not ferment lactose. It should be pointed out that a greater number of air cultures of presumed nasopharyngeal origin failed to coagulate milk than would be expected with strains obtained directly from human sources. That only 4.3 per cent of *equinus* cultures affected milk is in conformity with the report of Hodge and Sherman³ who observed that none of 72 recently isolated *equinus* strains studied had any effect on milk. Likewise the finding that 98.8 per cent of the *fecalis* strains fermented milk agrees well with a similar observation of Sherman, Mauer, and Stark⁴ on 434 cultures.

THE VARIANT FORMS OF ALPHA STREPTOCOCCI IN AIR

When the air sampling studies were begun there were observed in the Wells cylinders a number of suspicious pinpoint colonies which produced alpha hemolysis on blood plates but did not appear to be typical streptococci when examined microscopically after 18 hour broth culture.

Although they were Gram-positive cocci which varied in size in different cultures from small to large, as do air streptococci, they differed from the latter by appearing either as diplococcal forms, tetrads, or irregular groups of cocci, large or small. Usually one type of grouping predominated but seldom if ever was it the only one present. In addition occasional short chains comprising no more than 6 cocci were noted, but they were never predominant. Analysis of the microscopic morphology of 1,949 air strains reveals that only 39.6 per cent (771) formed typical moderate to long chains while the remaining 60.4 per cent (1,178 strains) formed predominantly pairs, tetrads, or groups of cocci.

In an attempt to arrive at an objective decision as to the identity of these aberrant strains, regarded provisionally as streptococci, two series of studies were undertaken: (1) a comparison of the biochemical and morphological properties of (a) definite alpha streptococci freshly isolated from human throats, (b) definite, and (c) putative alpha streptococci of air; (2) a comparison of the distribution of the several variant morphological types at the different locations and of the incidence of definite and putative strains of presumed nasopharyngeal origin in the several Holman species.

It was found that the aberrant organisms were probably altered streptococci.

TECHNIC ORIGIN OF CULTURES

The alpha streptococci of the throat were isolated from sheep's blood agar plates which had been streaked with routine throat swabs. They were obtained from the diagnostic laboratory of the Department of Bacteriology, College of Physicians and Surgeons. Both the definite and putative alpha air streptococci were isolated from Wells' sheep's blood agar cylinders which had been exposed in the usual places of sampling.

TESTS

The following properties were studied:

1. *Fermentation*—Brom-creosol purple meat extract broth was used, prepared according to the following formula: 0.3 per cent Liebig's meat extract, 1 per cent neopeptone, 0.5 per cent sodium chloride, and 1 per cent of the test substance. Thirty c.c. of 0.04 per cent brom-creosol purple solution were added to each liter of medium. The tests were performed by inoculating 2 drops of 18 hour broth

TABLE VI

A Comparative Study of Some Morphological and Biochemical Properties of Alpha Streptococci of the Throat and of Air, and a Group of So-called Putative Alpha Streptococci of Air

Cultures		Holman Species					Fermentation of Dextrose, Sucrose, Maltose, Levulose and Galactase				Fermentation of Raffinose							
		Salivarius		Mitis		Ignavus	Positive		Negative		Pos.	Neg.						
		Lactose + Salicin	Lactose + Salicin	Lactose + Salicin														
		Origin	No.	Mannite	Monnute	Mannite												
Throat		69	50	10	9	48	21	36	33									
Air	Definite	56	24	14	18	37	19	22	34									
	Putative	99	58	23	18	86	13	16	83									
Per cent		72.5	14.5	13.0	69.6	30.4	52.2	47.8										
		42.9	25.0	32.1	66.1	33.9	39.3	60.7										
		58.6	23.2	18.1	86.9	13.1	16.2	83.8										
Cultures		Growth on Blood Agar																
		Final pH in Dextrose Broth		Effect on Litmus Milk			Type of Hemolysis				Colony Morphology		Appearance of Broth					
							Clear	Green Discrete	Green Diffuse	Green	Clear Green	Moderate Green		Translucent	Opaque	Opaque White Center		
		Origin		Between 4.2 and 4.7	4.8 and 5.5	5.5 and 6.4	Acid and Coagulation	Acid	No Reaction	Clear	Green Discrete	Green Diffuse	Green	Clear Green	Moderate Green	Translucent	Opaque	Opaque White Center	Clear	Cloudy
Throat		45	17	0	48	16	5	50	2	4	3	56	3	0	34	35		
Air	Definite	30	17	6	35	11	10	40	5	5	4	46	6	2	22	34		
	Putative	5	68	23	5	65	29	57	23	9	9	18	55	25	8	91		
Per cent		72.6	27.4	0.0	69.6	23.2	7.2	84.8	3.3	6.8	5.1	94.9	5.1	0.0	49.3	50.7		
		56.6	32.1	11.3	62.5	19.6	17.9	74.1	9.1	9.1	7.7	85.2	11.1	3.7	39.3	60.7		
		5.2	70.8	23.9	5.1	65.6	29.3	58.2	23.5	9.2	9.2	18.4	56.1	25.5	8.1	91.9		

culture into 2 c.c. of the medium which had been Arnoldized on 3 successive days. Results were recorded at the end of 48 hours and 96 hours incubation at 37° C. Action on the following substances was studied: lactose, salicin, mannite, dextrose, sucrose, levulose, maltose, inulin, galactose, raffinose, arabinose, glycerine, and sorbitol.

2. *Final pH in dextrose broth cultures*—Cultures prepared as stated above were incubated for 7 days at 37° C. and then tested electrometrically by means of the glass electrode.* The pH value was calculated to the second

decimal place by reference with standard buffers of known pH, and recorded to the first decimal place.

3. *Effect on litmus milk*—Litmus milk was prepared by adding approximately 60 c.c. of litmus solution to 1 liter of defatted fresh pasteurized milk, and tubed in 2 c.c. amounts. Inoculations and readings were carried out in a manner similar to that for fermentation tests.

4. *Macroscopic and microscopic morphology and effect on blood*—All cultures were examined microscopically after 18 hour incubation in nutrient beef infusion broth (pH 7.6 to 7.8) and the relative clarity or cloudiness of the broth was recorded as well. In

*We are indebted to Dr. Theodor Rosebury of the Department of Bacteriology for the use of his glass electrode-saturated salt solution potentiometer.

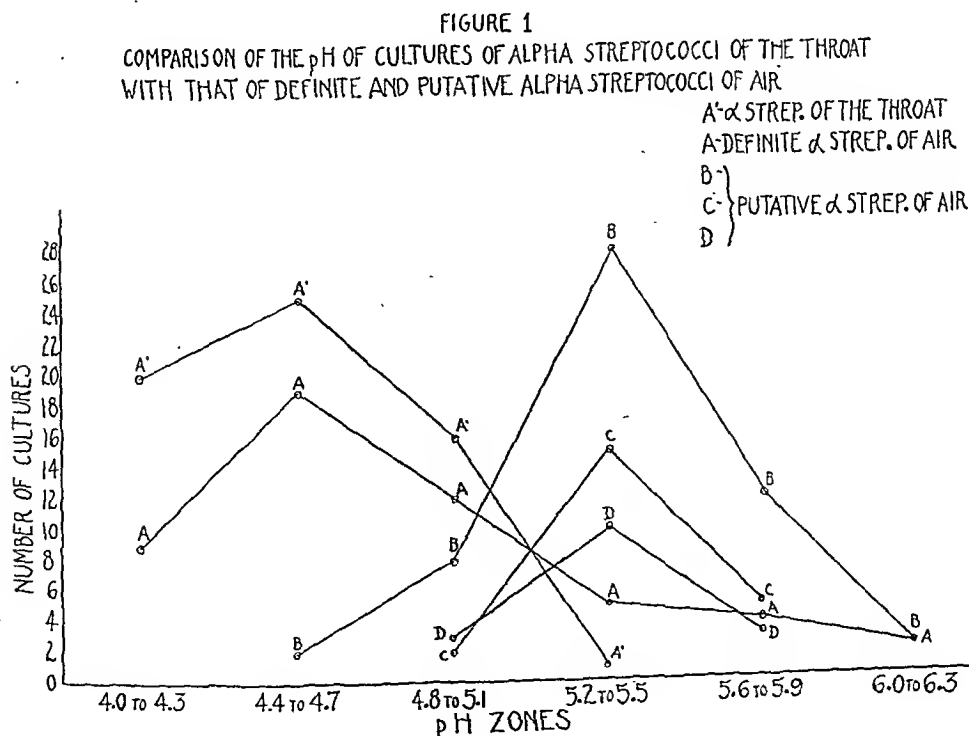
addition pour plates of 4 per cent sheep's blood agar were prepared with each culture. Type of hemolysis was recorded after 18 hours incubation at 37° C. and after 2 additional days at room temperature as well as the translucency of the colonies and the approximate ratio of surface to sub-surface colonies.

RESULTS

1. The fermentative action of 69 throat cultures on 3 sugars, lactose, salicin and mannite, which determine 8 species of alpha streptococci in the Holman classification, indicated that all cultures fell into one of 3 species—*salivarius*, *mitis*, or *ignavus*. Accordingly, only those actual and putative air alpha streptococci which gave similar reactions with the same substances and which composed a majority of the strains were included in the comparative study. It is seen from Table VI that the largest number of strains in

each group gave the reactions of *Str. salivarius*. Further discussion of the distribution of cultures in the 3 species of Holman is of doubtful value since Safford, Sherman, and Hodge² have recently concluded that they are in reality but a single species. Over 60 per cent of the cultures in each group fermented all of the 5 sugars: dextrose, sucrose, maltose, levulose, and galactose, with the putative forms having the highest percentage (86.9). On the other hand, the putative forms acted on raffinose only seldom (16 per cent); whereas 50 per cent of throat and 40 per cent of definite air forms fermented raffinose. Fermentation of the other substances studied (not included in the table) was rare; inulin was fermented by only 10 throat strains, 5 definite and 2 putative air strains; sorbitol by 1 strain each of the 3 groups; arabinose by 5 definite air strains only and glycerin by none.

Examination of the final pH values



in glucose broth cultures reveals a distinct difference between the putative air strains on the one hand and the definite air and throat strains on the other. The greatest number of the putative air strains yielded values in the pH zone 4.8 to 5.5, while most of the definite air and throat strains yielded pH values between 4.2 and 4.7. The data on pH have been further analyzed in Figure I, where the number of cultures is plotted as ordinates and the pH zones as abscissa. The putative air streptococci for this purpose have been separated into 3 groups on the basis of predominating microscopic morphology: in group B, diplococci; in group C, tetrads; and in group D, irregular groups or clumps. The graph indicates that most of the cultures of both throat and (definite) air streptococci fall into a zone of pH from 4.1 to 5.0 with a peak in both instances occurring at 4.4 to 4.7; whereas a great majority of each of the 3 putative air forms are distributed in a zone of pH between 4.8 and 5.9 with the peak in each instance occurring between 5.2 and 5.5.

Analysis of the effect of the several groups on litmus milk confirms the impression that the putative air strains are comparatively weak acid producers, since the majority of them form insufficient acid to coagulate milk. The obvious streptococci, on the contrary, both acidify and coagulate milk. These findings confirm an impression obtained when the routine sugar fermentations were performed: that the throat and long-chained air strains form more acid than the aberrant strains, as evidenced by color difference with brom-cresol purple indicator.

It was noted that all strains after 18 hours incubation at 37° C. in poured blood agar plates produced colonies surrounded by green zones. After further incubation for 48 hours at room

temperature several distinct patterns appeared. One, most common for all 3 groups, consisted of a zone of clearing immediately adjacent to the colony and about equal in width to the diameter of the colony which usually contained some intact red cells. Surrounding this area, was a narrower discrete green halo. About a quarter of the putative strains and a few of the definite streptococci showed a diffuse rather than a discrete green zone. Two less common patterns were observed with strains of all groups: (a) adjacent to the colony a discrete green zone, then a clear zone, and finally a second green zone; and (b) a green zone without differentiation.

The surface colonies were usually smooth and were either translucent, opaque, or opaque with a white center. Most of the throat and definite air streptococci gave translucent colonies, whereas the colonies of putative strains were opaque, with or without a white center. The translucent colonies grew on the surface in smaller proportion than did the opaque ones. The inference might be made, therefore, that opaque colonies tolerate free oxygen better than translucent ones.

The study of the relative turbidity of broth cultures disclosed the well known tendency of long-chained streptococci to produce an almost clear supernatant broth. Ninety-two per cent of the putative air streptococci, on the other hand, which displayed no long-chained forms, yielded cloudy broth.

2. The distribution of the 3 variant morphological types was consistent in the several locations. Thus the figures for pairs, tetrads, and groups in schools (1,286 strains) were 25.1, 8.9, and 23.6 per cent, respectively, whereas those for all other locations (663 strains) were 26.5, 9.8, and 29.6 per cent.

The uniformity of distribution of the

TABLE VII

Comparative Distribution of Definite and Putative Streptococci of Air in the Throat Species of the Holman Classification

		<i>Str. Salivarius</i>		<i>Str. Mitis</i>		<i>Str. Ignavus</i>		<i>Total</i>	
		<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%*</i>
All Locations	Definite	503	74.1	137	20.2	39	5.7	679	41.9
	Putative	633	67.3	180	19.1	128	13.6	941	58.1
Schools	Definite	385	76.4	99	19.6	20	4.0	504	45.3
	Putative	443	72.7	101	16.6	65	10.7	609	54.7
Subway	Definite	85	69.7	28	23.0	9	7.3	122	56.7
	Putative	57	61.3	22	23.7	14	15.0	93	43.3

* Per cent of definite and putative cultures combined.

several morphological types is depicted by a different method in Table VII. The percentage distribution of cultures in the 3 throat species at both schools and the subway indicate a good correlation between the incidence of definite and putative strains.

SUMMARY

Although most properties of definite air streptococci agree well with those of throat strains, several properties of the putative strains are at variance. The putative strains are similar to those of the throat in the fermentation of lactose, salicin, mannite, dextrose, sucrose, maltose, levulose, and galactose; the last 5 are fermented more frequently by the former than by the latter. Likewise, putative strains yield the same general type of colonies and produce similar hemolysis on blood agar. There may be added as points of similarity the occasional suggestion of streptococcal morphology (a few very short chains) in some putative strains, and their consistent distribution in air similar to that of definite streptococci. Finally, attempts made in this laboratory to age putative strains in broth in order to dissociate chains of cocci from them have yielded suggestive results. Conversely, throat strains of streptococci aged in like manner have given some indications that they may

produce cocci of altered grouping. It seems justifiable, therefore, to assume that the aberrant forms are closely related to the streptococci of the throat and possibly derived from them.

If this hypothesis be accepted, one cannot help but be impressed by the marked differences between the altered and the typical streptococci. The former, besides differing microscopically, produce far less acid, seem to ferment raffinose less frequently, form opaque colonies more frequently, and are better adapted to aerobic growth. Since our experience with throat strains suggests that such variant green streptococci are rarely if ever present in the nasopharynx, and since it is difficult to believe that their normal habitat is the air, it would appear that their aberrant characteristics developed as a result of their aerial environment.

DISCUSSION

Two principal questions asked at the inception of this study were: (1) Does the presence of alpha hemolytic streptococci in air indicate human pollution thereof? (2) Can quantitative estimation of their numbers serve as an index of the degree of pollution? The first question would seem to be answered affirmatively since the results in schools, a subway, and theatres indicate that a great majority of air alpha streptococci

are probably of human nasopharyngeal origin. Comparison of several properties of a number of strains of air streptococci with those of streptococci isolated from throats reveals a high degree of correlation.

It also seems most likely that the number of alpha streptococci present in air indicates the degree of human pollution. The latter in turn is probably influenced by the extent of current or recent occupancy and the quality of ventilation. Since the conditions obtaining during routine sampling at the several types of locations could not be readily controlled it is difficult to evaluate finally the relative importance of crowding and ventilation. However, it appears that other conditions being constant the effects of ventilation are more important than those of crowding. Thus subway cars, which are grossly overcrowded at certain hours but which have adequate ventilation, had less streptococci than schoolrooms which usually provide much more air space per person but are not so well ventilated. Similarly fewer positive samples and fewer streptococci per sample were also obtained from theatres where larger numbers of persons congregate in single rooms than in schools. Here the presence of more persons appears to be compensated for by the diluting effect of a large air space which in addition is supplemented by an almost constant influx of fresh air. Incidentally the smaller percentage of positive samples in air conditioned as compared to non-air conditioned theatres might also be regarded as an expression of better ventilation.

It is obvious that, in the absence of guiding precedents, it is difficult to set absolute standards of quality on the basis of the total number of alpha streptococci in air. It is not so difficult, however, to assess the fact that the schools studied had far more strep-

tococci per available unit of space than any other type of location; or that certain schools, which had the highest index of streptococci, also were the oldest and the most difficult to keep clean, and were so constructed that there was a maximum of pupils in a minimum of space. These findings were in schools all of which were relatively old. Newer schools, with better ventilation, would probably show better conditions.

It is apparent that a majority of alpha streptococci of air have become altered in morphology and physiology. In experiments not recorded above it was found that a sweeping of unoccupied schoolrooms immediately before taking air samples resulted on the average in a twofold increase of the alpha streptococci of air. It seems clear, therefore, that the normal air flora of occupied rooms must include streptococci of both recent and remote human origin. These findings suggest that respiratory pathogens cast into air may likewise persist and become altered. Indeed it has been shown by White⁵ that beta hemolytic streptococci can be obtained from the air of unoccupied hospital rooms by sweeping their floors as long as 2 weeks after the removal of patients suffering from puerperal fever. Likewise Brown and Allison⁶ recently found that hemolytic streptococci can be isolated with relative ease from scarlet fever wards. These authors observed that the greatest numbers of organisms were found in the morning hours due to the various morning activities such as sweeping, cleaning, making of beds, etc. These persistent forms may be regarded as potential pathogens, but to what degree they may have been altered by their aerial environment is not known.

The nature and significance of such aerial changes, if they occur, with particular reference to possible epidemio-

logical effects, are questions for further study. Work is now in progress in which under controlled conditions of temperature, humidity, light, ionization, etc., it is hoped to ascertain not only the lethal but also the debilitating action of air on organisms artificially sown therein.

SUMMARY

Streptococci of the alpha hemolytic types were found to be widely distributed in the air both of enclosed places of congregation and of the open spaces of a large city. A large majority of these organisms seemed to be of nasopharyngeal origin. Many of the strains, of presumed nasopharyngeal origin, differed in morphology and certain biochemical properties from typical alpha streptococci of the throat. It is suggested that these differences are due to the effects of aerial environment. The possibility of similar alterations in respiratory pathogens is discussed.

Alpha hemolytic streptococci were present most frequently and in greatest numbers in the air of school buildings, and an apparent relationship was noted between the type of room and degree of occupancy and the numbers found, the largest numbers being found in occupied assembly and classrooms.

The quantitative distribution of streptococci in the other types of locations may be listed in a descending order as follows: Subway, non-air conditioned theatres, air-conditioned theatres, streets and park.

An attempt is made to associate the differences in streptococcal content of the several types of enclosed places, as well as in the individual schools, with their varied facilities for ventilation.

ACKNOWLEDGMENTS—It is a pleasure to record our indebtedness to Professor Earle B. Phelps, who inspired these studies, for his constant advice and encouragement. We also wish to acknowledge with thanks the interest of and assistance given by Deputy Commissioner of Health Sol Pincus, who was in charge of the Air Pollution Survey. Finally, the fine coöperation of Harry R. Saint, Project Engineer, A. C. Stern, Superintendent, and other members of the W.P.A. administrative staff deserves our appreciation.

REFERENCES

1. Pincus, Sol, and Stern, A. C. A Study of Air Pollution in New York City. *A.J.P.H.*, 27:321, 1937.
2. Safford, C. E., Sherman, J. M., and Hodge, H. M. Streptococcus Salivarius. *J. Bact.*, 33:263, 1937.
3. Hodge, H. M., and Sherman, J. M. Streptococcus Equinus. *J. Bact.*, 33:282, 1937.
4. Sherman, J. M., Mauer, J. C., and Stark, Pauline. Streptococcus Fecalis. *J. Bact.*, 33:275, 1937.
5. White, Elizabeth. On the Possible Transmission of Haemolytic Streptococci by Dust. *Lancet*, 941, 1936.
6. Brown, W. A., and Allison, V. D. Infection of the Air of Scarlet-fever Wards with Streptococcus Pyogenes. *J. Hyg.*, 37. 1. 1937.

Nutrition and Dental Caries*

BION R. EAST, D.D.S.

Technical Consultant, Vitex Laboratories, Inc., Harrison, N. J.

DIFFERENCES of opinion exist regarding the etiology of dental caries. Some insist that one type of bacteria is the cause of this disease which universally affects man; affecting him apparently, in direct proportion to the degree of his civilization. Others advance faulty oral hygiene, endocrinology, malformation, genetics, or malnutrition as the cause. Probably all these, and possibly other factors play a rôle. The neglect of any one factor during an investigation may lead to faulty conclusions.

The slogan "A clean tooth never decays" has been drummed into a believing public by some of the dental profession and commercial interests. Millions of dollars are spent annually for tooth brushes, dentifrices, and mouthwashes, but the incidence of dental caries keeps apace among our population at large.

The immediate cause of dental caries, when found, will probably be simple, and it will, when discovered, be of great interest. But from the public health standpoint, the pressing question is what can be done to help alleviate the condition at present.

A review of the literature discloses few reports presenting valid data on this subject. Many papers are disregarded here because they present: (1)

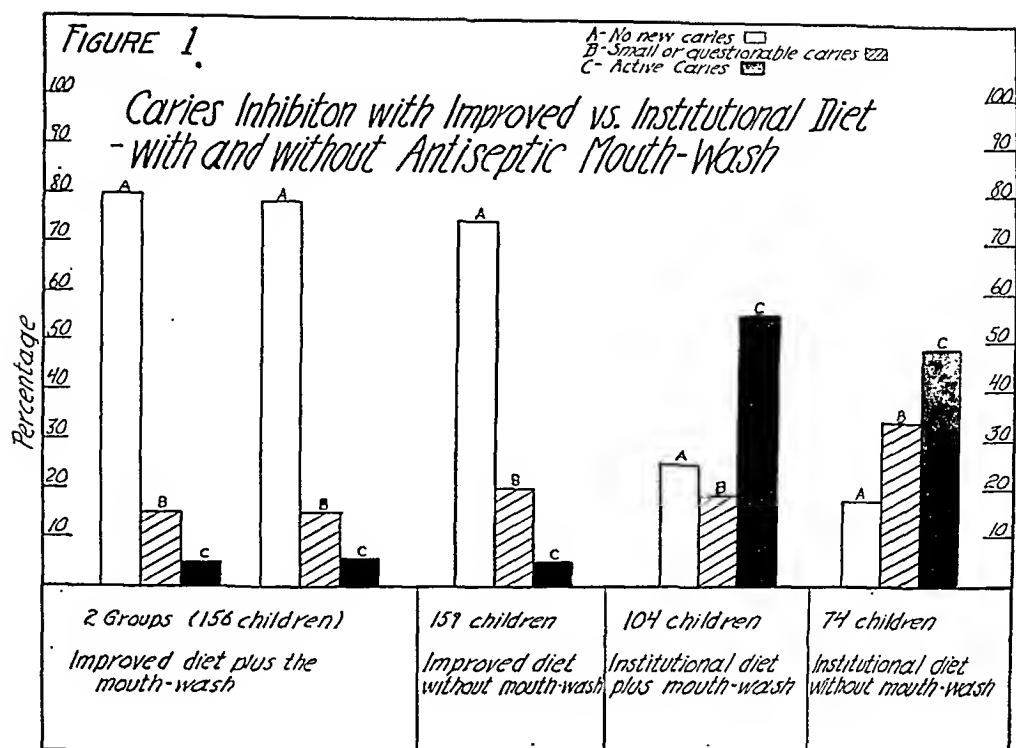
simply opinion; (2) the numbers in the experiment were too small to give significant results; (3) proper control was not exercised; (4) more than one variable was used in the same experiment; (5) when a vitamin (particularly vitamin D) has been studied, an assay of material was not made, therefore the potency of the material was unknown; and (6) vitamins D of different sources (vegetable and animal) have been considered as being identical.

After subjecting published studies to these tests, few investigations made on humans need analysis. Studies of children as outpatients are disregarded here because of the difficulties of imposing control. Animal experimentation is also disregarded because the final test of anti-caries control in humans should be controlled human experiments.

One study, that of Bunting, et al.,¹ is of particular significance because under controlled conditions 493 children, located in two orphanages, were used to determine the caries preventing and arresting properties of an institutional diet with and without the use of an antiseptic mouthwash, and that of an improved diet with and without the mouthwash. The study covered 2 years.

Figure 1 demonstrates the reported results. Those fed the improved diet with or without the mouthwash had practically the same results. The institutional (unimproved) diet groups—with or without the mouthwash had more new cavities and more active

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.



caries than those on the improved diets with or without the mouthwash.

The group fed the institutional diet with the mouthwash had more new caries and more active caries than the group fed the same diet without the mouthwash. One might deduct from this experiment that the mouthwash was caries-inducing. The significant results are the marked reduction in new caries in the groups which were fed the "well-balanced well-fortified" diet. This improved diet had as its base one quart of milk per day, with green vegetables and fruits. The improved or experimental diet was substantially that recommended by Boyd and Drain except that no added vitamin D was given.

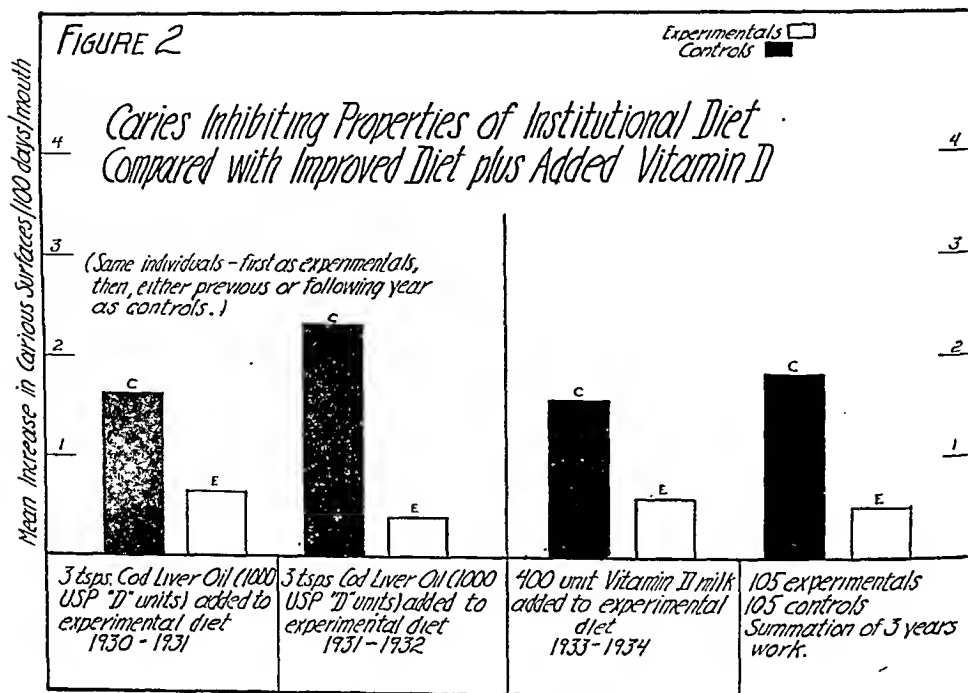
McBeath^{2,3} reported studies to determine the caries preventing properties of diets. His investigations were made in orphanages in and about New York City. He noted that improving the diets resulted in a marked decrease in new carious tooth surfaces. He also observed that the dietary factor which

was usually most deficient in an otherwise well balanced, easily obtainable diet was vitamin D. He reports significant success in caries control when various amounts of vitamin D are added to the diets.

Mellanby⁴ and Anderson⁵ have reported likewise.

In Figure 2 are shown some of McBeath's results. There is a definite decrease in the caries incidence in the groups receiving the diets with added vitamin D. The studies of the years 1930-1931 and 1931-1932 are particularly interesting because the same individuals used as experimentals were controls in the previous or the following year. The groups were reversed and the caries incidence was likewise reversed.

In 1934 McBeath⁶ reported the caries inhibiting properties of graded amounts of vitamin D when given as vitamin D milk. The vitamin D milk supplemented the institutional or control diet. The results in caries control achieved with the experimental diets



are contrasted with those on the control diets. The caries inhibition was in direct proportion to the amount of vitamin D given. The anti-caries effect of direct exposure of the skin to ultra-violet light was also demonstrated.

Since the publication of the McBeath 1933-1934 work, McBeath and Zucker⁷ made further analyses of the data collected during the 3 year investigation. Through the extreme courtesy of the authors the data, in part, are here presented before publication.

In all, over 800 children were observed. The children ranged in age from 8 to 14 years. They were about equally divided according to sex. They were all resident during the complete study period of orphanages where control could be established and maintained.

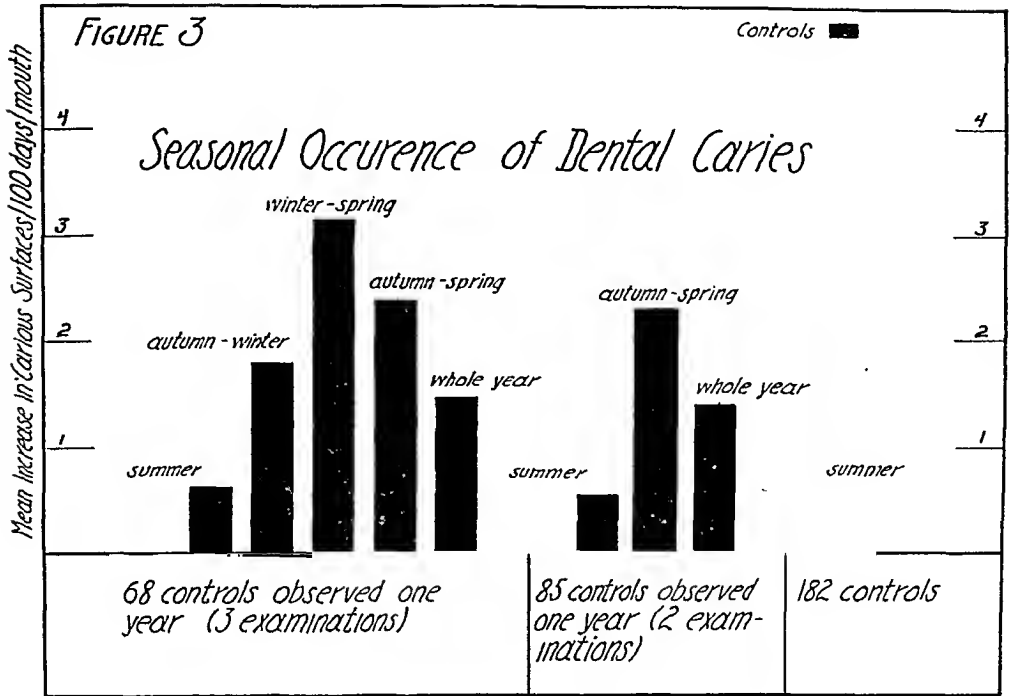
A notable contribution is observations of the incidence of caries during various seasons of the year. There is apparently a marked seasonable response. The period designated as autumn-winter covers about 100 days

from the autumn examination. The winter-spring period ranges from the mid-winter examination to spring. Autumn-spring is a combination of the two periods.

In Figure 3 is shown the mean increase in carious surfaces per 100 days per mouth of controls observed over a complete calendar year and examined at various intervals. The highest incidence is during that period most remote from the summer.

In Figure 4, the seasonal response is again demonstrated together with the caries inhibiting influence of various amounts of vitamin D in the form of vitamin D milk. A like response was demonstrated when the skins were exposed to ultra-violet light.

Boyd and Drain of Iowa have reported observations of dental caries control over a period of years since 1928.^{8,9} Their data will not be discussed at length here. Their criterion has been the arrest of established dental caries rather than prevention of primary lesions involving the enamel.

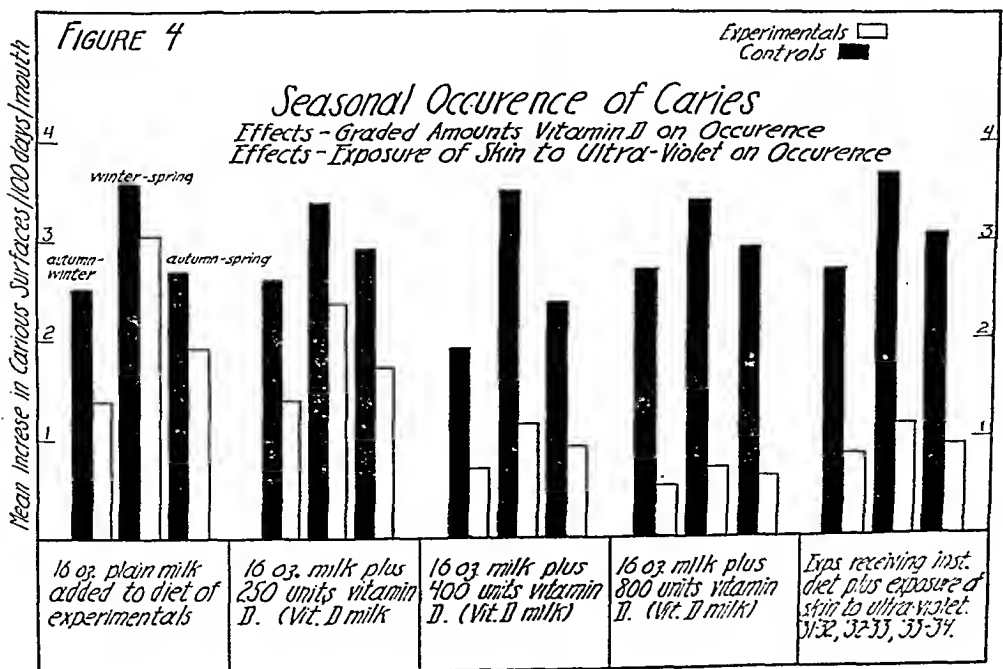


They studied dentinal rather than enamel caries. This has led to confusion where the difference has not been appreciated by critics.

In brief, Boyd and Drain report that a well rounded diet, when actually consumed by normal children, will arrest established caries. The recommended

diet is simple. It consists of the following essentials:

- 1 quart of milk per day
- 1 egg
- 1 ounce of butter
- 1 teaspoonful of cod liver oil (the year around)
- 2 vegetables (one being raw)
- Fresh fruits



Candy is not prohibited *after* meals. In groups under well controlled conditions, where the consumption of the food was definitely known, arrest took place in 10 weeks' time. The "activity of caries was determined on the basis of the permeability of the exposed dentine to the exploring tine; if at all permeable the decay was considered active."

Recently, Boyd, Drain, and Stearns¹⁰ reported a hospital controlled balance study on a small group of children from 3 to 6 years of age. The study covered 7 months. The individuals were fed in succession 4 diets. The principal difference in these 4 diets was the amount of vitamin D fed.

The children had active caries of the dentine. The criterion was activity of caries. During the 1st period, the children were continued (in the hospital) on the orphanage diet; during the 2nd the hospital diet except no added vitamin D was given; during the 3rd, irradiated milk with 155 units of vitamin D was substituted for the plain milk previously fed. Following these 3 periods the authors state: "For many weeks status was virtually stationary with minimal but definite activity, even after the children had received a diet of high protective value aside from its vitamin D content for 5 months."

During the 4th and final period, the children were continued on the same diet except the vitamin D content which was increased to 600 U.S.P. units per day in the form of cod liver oil. In this final study period after 9 weeks,

the results were: "The caries was finally adjudged arrested and this was confirmed by subsequent examination."

SUMMARY

1. Improving the diets of children living under controlled conditions seems to lessen the occurrence of caries. These results seem uninfluenced by the use of an antiseptic mouthwash.

2. The seasons seem to affect the appearance of caries—that period most remote from summer having the greatest incidence.

3. Vitamin D seems to play an important rôle in seasonable caries occurrence; its presence in the body either as a result of direct exposure of the skin to ultra-violet light or by its inclusion in the diet, tends to lessen the seasonable variation.

4. A diet which is caries inhibiting without added vitamin D becomes more inhibiting when vitamin D is added either as cod liver oil or as vitamin D milk.

REFERENCES

1. Bunting, Jay, and Hard. *J. Am. Dent. Assoc.*, 18:672-78, 1931.
2. McBeath, E. C. *J. Dent. Res.*, 12:723-46, 1932.
3. McBeath, E. C. *New York State J. Med.*, 18:1086, 1933.
4. Medical Research Council (Final Report). "The Influence of Diet on Caries in Children's Teeth." *Special Report Series*, 211.
5. Anderson, Williams, Halderson, Summerfeldt, and Agnew. *J. Am. Dent. Assoc.*, 21:1349, 1934.
6. McBeath, E. C. *A.J.P.H.*, 24:1028-30, 1934.
7. McBeath, E. C., and Zucker, T. F. Unpublished (in press).
8. Boyd and Drain. *J.A.M.A.*, 90:1867, 1928.
9. Boyd, Drain and Nelson. *J. Dis. Child.*, 38:721-25, 1929.
10. Boyd, Drain and Stearns. *Proc. Soc. Exper. Biol. & Med.*, 36:645-46, 1937.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear. The By-laws of the American Public Health Association provide that no statements shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council.

EDITORIAL SECTION

MAZŮCK P. RAVENEL, M.D., *Editor*

REGINALD M. ATWATER, M.D., *Managing Editor*

AUGUSTA JAY, *Editorial Associate*

EDITORIAL BOARD

(Names to be announced)

VINSON-BARKLEY BILL

AMONG the resolutions adopted at the Association's 66th Annual Meeting in New York City during the week of October 4 was one supporting the Vinson-Barkley bill (H.R. 2711) as providing the best procedure and organization for lessening the danger to public health from stream pollution. This proposed federal legislation was passed by the House of Representatives on April 21 and by the Senate in amended form on August 16. The first session of the 75th Congress came to an end before agreement was reached by the House and Senate Conferees appointed to reconcile the differences in the bill as passed by the two Houses of Congress. Further consideration of a compromise agreement by the Conferees awaits the reconvening of the 75th Congress, either in the special session convened November 15 or in the regular second session in January, 1938.

The previous history of the Vinson-Barkley bill which will grant to the United States Public Health Service enlarged responsibilities and duties for coöperation with the states in water pollution control is of interest. The original bill was prepared and sponsored by the Committee on Stream Pollution of the Cincinnati Chamber of Commerce in January, 1936. Hearings were held by the Committee on Rivers and Harbors of the House of Representatives and by a sub-committee of the Committee on Commerce of the United States Senate on May 20 and 21, 1936, respectively. These committees of the 74th Congress reported out a substitute bill recommended by the Conference of State and Territorial Health Officers which was acceptable to the sponsors of the original bill. Before the adjournment of the 74th Congress in June, 1936, the bill had passed both the House and the Senate, but did not become law as it was delayed for reconsideration in the Senate, which was not reached before adjournment. Reintroduction in the 75th Congress has placed the proposed federal water pollution control legislation at a point where its fate depends to a great extent upon the action of the House and Senate Conferees when Congress next convenes.

The Vinson-Barkley bill as passed by the House of Representatives provides for federal water pollution control in accordance with principles which have led to success in other federal aid projects, which are as follows: (1) The stream pollution program is turned over to a long established federal agency in a regular

government department under trained career personnel who have had years of experience in working with state and local officials. (2) The federal government does not attempt to do the work of controlling stream pollution as actual abatement work will be done by the states, with the full coöperation and encouragement of the federal government. (3) The main basic principle is the matching of federal funds with states and municipalities, and the loaning of funds to state, municipalities, and industries for remedial treatment works involving financial participation and responsibility for the actual construction by the state and local agencies. (4) Funds are furnished the states through allotments to the state health authority for the maintenance of a continuous program of promotion, investigation, and planning.

The more important changes proposed in the Vinson-Barkley bill by the amendments added in the Senate are (1) granting of the consent of Congress for two or more states to enter into agreements or compacts for the abatement of water pollution, (2) classification of the navigable waters of the United States by watershed districts, (3) making of industrial polluters of navigable waters eligible for federal grants-in-aid for the construction of remedial treatment works, (4) establishment of limiting requirements for polluting material and for the extent of treatment needed in such navigable water districts, and (5) provisions for action in the federal courts for the abatement of water pollution when constituting a public or common nuisance as defined in the amended bill.

The acceptance of these amendments by the House of Representatives would make the bill more satisfactory to those groups favoring centralized governmental control of water pollution as contrasted with the views of its original proponents who advocate the principle of coöperation of the federal government for improved state control. These amendments would modify the two essential elements of the Vinson-Barkley bill necessary for constructive work in stream pollution control, which are (1) the strengthening of the state organizations so as to be able to respond to public demand for adequate enforcement of state laws and regulations, and (2) the availability of federal funds for loans and grants to states and municipalities, and loans to industry for stream pollution abatement.

Friends of the original Vinson-Barkley bill are reported to be of the opinion that the whole effort is likely to be lost unless the original bill without substantial modification is reported back to the Senate by the House and Senate Conferees. Acceptance by the House of Representatives of the amended bill as passed by the Senate is doubtful, for the House appears committed definitely to the principle of state control and abatement of water pollution. Moreover, there is serious question as to the constitutionality of federal court action in water pollution matters.

Members of the public health profession, who have definite views on the merits of state and federal control of stream pollution, would serve a useful public service by communicating their views to the House and Senate Conferees as it is quite likely that the bill will receive their attention as soon as Congress convenes. The House Conferees are headed by the Honorable Joseph J. Mansfield of Texas, Chairman of the House Committee on Rivers and Harbors. The Honorable Royal S. Copeland, United States Senator from New York and Chairman of the Senate Committee on Commerce is the ranking Senate Conferee. It would be unfortunate, to say the least, if this important and constructive federal legislation should fail at this time.

It is no exaggeration to estimate conservatively that the future abatement of water pollution on a broad comprehensive scale will be retarded by a decade or more if this meritorious legislation does not become law at this time.

STANDARD BIRTH AND DEATH CERTIFICATES

THE Bureau of the Census has sent out, within the last month, a set of three questionnaires, to obtain an expression of opinion on revision of the Standard Birth and Death Certificates and on the desirability of setting up a Standard Stillbirth Certificate. The questionnaires have been sent to public health agencies, county medical societies, specialized medical associations, schools of hygiene and public health, and many other organizations and individuals interested in public health and the collection of vital statistics. This represents a unique opportunity, to those in public health work, to have a part in the determination of what material is to be collected in vital statistics for the decennial period 1940-1950.

Upon the return of these opinions, a careful analysis is proposed by the Bureau of the Census, to be used as the basis for making up a set of preliminary forms. These preliminary schedules will then be sent to the various public health organizations for criticism and comment. After revision the new Standard Certificates will be recommended to the states for universal adoption for the next decade.

The major problems involved in revision of the present certificates are: improvement of the cause of death information, completeness on place of residence, determination of the need for a Standard Stillbirth Certificate, and simplification of the certificates without the elimination of desirable supplemental information.

There are many objections to the present statement, on the death certificate, of the cause of death questions. The chief objections arise from the difficulty in determining "primary cause of death." This difficulty is partly due to the lack of a time sequence for multiple causes. A definite time sequence would be of material assistance in determining the actual cause of death.

In reporting residence there has been some confusion among the doctors and others filling out the certificates. The confusion has arisen in differentiation of place of death or birth and place of residence. Many suggestions have been made to remedy this situation, among them one which would ask place of birth or death and residence in parallel columns with the same information for each.

The need for a stillbirth certificate has been discussed widely at meetings of the American Public Health Association and recommended by its sub-committees for adoption as one of the standard certificates.

The questionnaires suggest simplification of the birth and death certificates by placing only the basic legal information on the face and collecting important supplemental data, applying to but one cause or group of causes of death, on the back or on a supplemental schedule. The attention of those interested is directed to this important item on the questionnaire.

In view of the wide clearance being attempted, it is urged that all those interested in vital statistics and public health work send in their opinions promptly on the forms provided or write to the Bureau of the Census for a set of questionnaires.

PUBLIC HEALTH EDUCATION*

To Librarians, Research Workers, Students, and Health Education Workers:

In earlier years the annual index to the *American Journal of Public Health* carried no references to this "Education and Publicity" or "Public Health Education" department in the *Journal*.

This paragraph then supplements the index: starting with July, 1923, the department will be found in all issues, except in two of 1924, and one each in 1929 and 1935.

Children Have the Last Word—

In England, according to the school medical officer of West Riding,

"dental propaganda might well be concentrated on the children themselves, rather than on the parents . . .

"The last word as to whether a child will accept dental treatment remains with the child in a majority of cases" says one member of the dental staff.

"The difficulty is probably not solely due to lack of parental control. There is a persistent tendency to regard dentistry merely as a service for the relief of pain and for purely cosmetic purposes."

In *Mother and Child*, 5, Tavistock Sq., London, W.C.1, England. Nov., 1937. 9d.

A Significant Amalgamation—

Of great importance in the school health field is the step described in the following selected paragraphs:

On the 28th of June, the American Physical Education Association and the Department of School Health and Physical Education of the National Education Association were officially amalgamated to form the American Association for Health and Physical Education—a Department of the National Education Association. This merger (seeks) . . . to unite the efforts of health educators,

physical educators, and leaders in school recreation under one organization. . . .

The reorganization carried over the larger part of the organization of the American Physical Education Association, with some changes and additions. The officers elected by the A.P.E.A. at the New York meeting were continued, as were the Governing Board and the Legislative Council. Three *divisions* were added: the Division of Health Education, the Division of Physical Education, and the Division of Recreation . . . four new sections were added under the Division of Health Education, as follows: (1) Health Education Teacher Training Section, Dr. C. E. Turner, Massachusetts Institute of Technology, Chairman; (2) School Physicians Section, Dr. Don W. Gudakunst, Department of Health, Detroit, Chairman; (3) School Nurses Section, Lulu V. Cline, South Bend, Ind., Chairman; and (4) Nutrition Section, Carlotta Greer, Cleveland, Chairman. These sections, with the Health Instruction Section with Major E. V. Graves of the State Department of Education, Virginia, as Chairman, form the Health Education Division under the chairmanship of Dr. Edna W. Bailey of the University of California, Berkeley, the immediate Past-President of the Department of School Health and Physical Education of the N.E.A. . . .

The new Association will continue to publish the *Journal of Health and Physical Education* and *The Research Quarterly*, and will carry on the work in physical education that was done in the past by the A.P.E.A. In addition, however, the American Association for Health and Physical Education assumes new and profoundly important tasks. First, the Association, through the Division of

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Health Education, hopes to give unity and leadership to much of the work in health education as it affects the school. To this end—just as the A.P.E.A. did and the new Association will continue to do with physical education national professional organizations—national organizations in the field of health education that are desirous of coöperating, are invited to become affiliated organizations, to have a voice in the Legislative Council, and to participate as organizations and as individuals in our work, our deliberations, our legislation, and our conventions—state, district, and national. In addition, we are hopeful that the experts in all fields of health education will coöperate with the Association in furthering the service to be rendered by the Association, without in any way lessening or limiting their services as individuals or through other professional organizations through which they have been accustomed to work. . . .

The merging with the National Education Association affects the Association most favorably. No limiting restrictions have been imposed. The same state, district, and national organizations and meetings will be continued and expanded to include health education and recreation in each constituent organization of the Association. In addition, the organized forces of the National Education Association will be at the service of the American Association for Health and Physical Education in every way possible. . . .

In *Journal of Health and Physical Education*, Ann Arbor, Mich. Sept., 1937. 35 cents.

Again the March of Time—Any new "March of Time" with a health episode is a health education event of nearly world-wide significance. Shown in 7,847 theatres in the United States, just beginning in Canada, and in 3,227 theatres in other countries, we may assume that no other health education material reaches so widespread a popular audience.

Issue 4, volume 4, first released Nov. 26, 1937, carries "The Human Heart." The official synopsis is as follows:

Outstanding in this issue is another of those episodes dealing scientifically, but in layman's terms, with medical subjects for which The March of Time rapidly is becoming famous. In this instance the subject is

heart disease—ailments of the heart and circulatory system. Only recently The March of Time was awarded the Clement Cleveland Medal of the American Society for the Control of Cancer in recognition of "the year's most effective contribution to cancer control"—an episode in a recent release called "Conquering Cancer."

There are several—to the layman—startling facts developed by pictures, charts and statistics in the present episode on heart disease. That heart disease leads the national death rate comes as something of a shock to the average man: 449,844 deaths in 1935, more than three times the fatalities attributed to cancer, which holds second place. Astonishing, although seemingly somewhat ironic, is the suggestion advanced by some specialists that the position held by heart disease as the U. S. No. 1 killer may really be due to beneficent causes, since thousands who might once have died young, now live to a ripe old age to succumb eventually to simple deterioration of the heart.

Greatest progress, however, has been made in controlling heart ailments of children. The familiar and once-neglected "growing pains" are now diagnosed as a symptom of rheumatic fever, menace to youthful hearts. The March of Time shows how science is treating children with crippled hearts, teaching them "a new way of life," so that they can face a future not of pain and sudden death, but a comfortable and confident life.

An extensive "Clip and Work Sheet," going to individual exhibitors, suggests ways of promoting local interest in the picture, including the coöperation of medical, health, and many other groups. A variety of advertising materials is supplied. The net result will be not only large audiences for the picture wherever shown, but also that millions will read in the advertising some of the pertinent facts. Truly "Time Marches On" for health education.

A Junior Board of Directors—The E.C.D. against tuberculosis among high school students started the idea out in Indiana.

The trend in modern education to encourage student participation and self direction may offer us new pathways to the problem.

One educator says: "The most hopeful development in student activities is the encouragement given them by intelligent and informed community leaders on the problems of today and the environment in which they live." He recommends that these young people be initiated into the skills and attitudes of adult life.

Why not encourage active participation in the tuberculosis program? Why not devise some method through which they can express themselves and evolve practices that will lead to action?

Schools and teachers are coöperating to the full. The tuberculosis association itself needs closer relations with the students. Board members are prominent and experienced in life. There is no representation of the 'teen age group.

Our horizon must be broadened to include this group, so why not a Junior Board? The conclusion reached by the St. Joseph County Anti-Tuberculosis League was such as to create such an organization by asking each one of the fifteen senior high schools to appoint, elect, or select in some manner one junior and one senior to represent that high school.

The superintendents of schools and high school principals were personally consulted regarding the advisability of such procedure, and we were highly gratified by their responsiveness. They gave it their unanimous endorsement and agreed that it was a constructive project from the standpoint of the schools.

What definite duties could be assigned to that body was the next question. A survey of present activities showed enough weak spots to offer an immediate solution to this problem.

The article lists the activities, and the reasons for seeking student responsibility for them, including state health poster contest, Christmas Seal newspaper, tuberculin tests, entertainments at the County Tuberculosis Sanatorium.

In its brief existence of 2 months the junior board has scored several times. In one direction:

Eighty-five per cent of St. Joseph County's high school seniors received tuberculin tests this year—with 4 high schools 100 per cent.

Then there was publicity.

From the standpoint of publicity alone the Junior Board has proved itself an asset to the Tuberculosis League. The two local newspapers as well as every high school publication have considered the organization of the Junior Board and its activities front page news. As one board member expressed it: "We found ourselves splashed all over the front page of the *Hi-Times*." Interviewed by their classmates and called upon for stories, the students have given the Tuberculosis League and its program wider publicity than it had ever before experienced.

Told by Irma Collmer, St. Joseph County Anti-Tuberculosis League. South Bend, Ind., in *Hoosier Health Herald*, 130 E. Washington St., Indianapolis, Ind. Nov., 1937.

"Any Number of Wives"—Lango, Uganda Protectorate, won a silver-mounted wall plaque for its share in Empire Baby Week. The response to infant welfare clinics led to a maternity and child welfare section of a health exhibition at Lira.

Prior to the occasion, publicity was arranged by circularizing the chiefs, by posters and propaganda at dispensaries and clinics throughout the district, and by a tour of the chief's headquarters by an assistant district commissioner about a fortnight previous to the show. The principal bait to lure mothers to Lira was a daily baby show on the first four days of the show. On one other day there was a competition for the healthiest family group consisting of a father with any number of wives and a quota of at least three children. The *bona fides* of each party had to be certified by the village chief. The baby shows were enormously popular, some mothers walking fifteen miles to attend. As they arrived, the mothers and babies were taken to a large hut built specially for the baby show and judging. This "baby banda" was reached by passing through a plot containing a model family dwelling. On leaving the baby show the people were directed through another plot containing a model maternity hut, showing the sanitary conditions that could be achieved for a confinement in a native hut. All the accessories were hygienic and efficient, but cheap. The baby's bath was a large gourd in a wooden frame.

Of particular interest was a kind of mannequin parade of hygienic dress for women. Lango women have only recently taken to wearing any clothes, and their tendency is to copy the clothing of the Baganda, which, though extremely graceful in their country, is not so well adapted to the needs of the Lango women, who spend much of their time on their knees grinding millet. A lady skilled in dressmaking was approached and produced several very attractive garments well calculated to suit the women's needs. The dresses were backless (as babies are carried on the backs and tend to soil the clothing), and were designed to allow easy accessibility to the breasts to facilitate suckling (it must be remembered that the ordinary Lango woman spends most of her adult life suckling a baby); other features of the "models" were short sleeves, short skirts, cheapness and adaptability to the figure, as the average Lango woman has a child once a year. The garments were available at from 1s. to 2s. at the local Indian bazaar. It is estimated that 50,000 natives attended the show during the whole period. The primary lesson stressed by the exhibits was the importance of good housing, and actual houses of a sanitary and enduring type were shown in course of construction. It is doubtful whether a health show has ever been arranged for people more primitive than the Lango. They are, however, making great strides toward improved methods of living.

In *Mother and Child*, 5, Tavistock Sq., London, W.C.1, England. Nov., 1937. 9d.

Workers Health Education—Studies in occupational disease, the effects of working conditions upon the workers, and provision of health education services are primary aims of the Medical Research Institute of United Auto Workers of America, organized in Detroit (Dr. E. R. Hayhurst, part-time Advisory Director).

Health education includes the preparation of educational material for distribution to locals and to shops, and provision of a consultation and educational service to shop stewards and locals who wish to use information for the improvement of working conditions.

In "New Vista in Detroit," by S.

Kellman. *Social Work Today*, 6 E. 46th St., New York, N. Y. Dec., 1937. 15 cents.

"Your Health" Continues—The current radio program of the American Medical Association is a threefold project. There are the weekly broadcasts; the monthly articles, and supplementary teaching material in *Hygeia*; and "Your Health: Pupil's Workbook and Guide." Large pages; outline for a self-appraisal and activities under each weekly topic; many blanks in which to write answers to questions; reading references, usually including page numbers. The weak point is the bibliography. Here are 53 titles, with authors, publishers, and dates. There are no prices or page numbers, and no indication of the contents, no suggestion as to what students or teachers are to do about the list. Not all of the references attached to the weekly units are to be found in this long list at the end.

Included are "Two to Six—Suggestions for Parents of Young Children," and "The Child From One to Six." One was published in 1933, the other in 1931. Shall teacher, or student, or school librarian choose "Two to Six" or "One to Six"? Shall we choose 1933 or 1931? And where would either volume fit into the broadcasting program? *Unhappily this bibliography follows precedent. We hope that a new precedent for health bibliographies will evolve from the pattern set by the American Child Health Association.*

Published by Johnson Publishing Co., 381 Fourth Ave., New York, N. Y. No price stated.

The broadcasts are booked for Wednesdays, 2:00 to 2:30 p.m., eastern standard time, over Red Network of N.B.C.

Contagious Diseases

January 5—Sneezes and Sniffles: Cause, spread, prevention of colds, pneumonia and

influenza; importance of early medical care.

January 12—Scarlet Fever, Measles and Whooping Cough: Modern attitudes toward these diseases; their prevention by community coöperation.

January 19—Smallpox and Diphtheria: Unnecessary diseases; preventable by immunization of infants.

January 26—Poliomyelitis: Information about the disease; coöperation with President's Birthday Ball.

Preventing Future Illness

February 2—Rheumatism and Arthritis: Known factors in the causation of arthritis and its care.

February 9—Healthy Hearts and Arteries: Known ways of protecting the heart against infection and hygienic abuse; how to live with heart disease.

February 16—Don't Fear Cancer—Fight It: Known factors in the cause, prevention and treatment of cancer.

February 23—Overcoming Diabetes: Individual efforts plus medical aid will win against diabetes.

Public Health

March 2—Water, Waste, and Sanitation: Importance of community control of water supplies, sewage disposal and general sanitary matters.

March 9—Protecting Perishable Foods: What the community can and must do to protect fresh foods such as fish, fruits, vegetables, meats, bakery goods.

March 16—Keeping Books on Health: The meaning and the importance of vital statistics, contagious disease reporting and community health records.

March 23—Catching Disease from Animals: Rabbit fever, rabies, undulant fever and similar infections, and what can be done about them.

"Ye Greate Stinking Poisonous Weed"—Quoted from the *New Haven Town Records*, May 23, 1653, this phrase is supposed to refer to the ragweed of 1937. And in 1937, as in 1653, the citizen of New Haven was urged in a well written statement to eradicate the "weed which grows against his own ground." In *Health*, New Haven Dept. of Health, Aug., 1937. Old records and old newspaper files may provide texts for any health agency.

Emphasis on the extending range of ragweed is given in "War on Ragweed," by H. B. Anderson. *Health*, Toronto, Ont. Sept., 1937.

That ragweed "is the cause of approximately 80 per cent of all cases" of hay fever is not recognized widely enough.

A School Safety Display—How DeWitt Clinton High School, New York City, put on a safety exhibition is described, with 5 large pictures, in "Visualizing Safety Education," by E. H. Hastings. *Journal of Health and Physical Education*, Ann Arbor, Mich. Nov., 1937. 35 cents.

It was hoped that the exhibit would serve a threefold purpose: first, to bring home the need for safety education; second, to demonstrate graphically safety practices; and third, to indicate the interaction between school and community organizations in making America safety conscious.

Our exhibit was a coöperative affair. Teachers and students drew the preliminary plans. Pupils selected aspects of safety education for individual study. A large committee of students served as receptionists, guides, curators, and handymen. The exhibit was held in one of our gymnasiums. Popular and community interest was so high that the exhibition hours were rearranged to give all parents who so desired an opportunity to attend.

Our hygiene students contributed an array of posters, notebooks, soap models, and original photographs. The chemistry department assisted with an exhibit on drugs and explosives. The general science department snooped around the rooms and corridors, exposed Petri dishes, and showed cultures grown from bacteria picked up on these jaunts. An excellent photographic study of safety devices in use throughout the school was submitted by the physics department.

The school custodian dramatized school and pool sanitation. Students in the art department built a miniature city. The city had skyscrapers, a model business district, and suburban homes complete even to the flower gardens. Miniature autos and pedestrians indicated traffic problems. Safety placards were very much in evidence.

The city police department had a giant display which occupied an entire section of the gymnasium. Pictures, posters, and a con-

tinuous movie reinforced their plea for safety. Two officers were on hand all through the week to lecture on traffic rules and regulations. So well did they do their task that by the end of the week not only had they befriended 6,000 boys, but they had put their message across!

Space does not permit proper mention of all the exhibits. Foreign safety posters added a colorful, thought provoking note. The American Red Cross showed safety devices for water and land. Many other organizations helped.

After our exhibits had been properly mounted, we threw the gymnasium open to students, teachers, and outside visitors. Hygiene, civics, English, and general science classes attended under the guidance of their teachers. Each pupil was asked to comment briefly on the particular exhibit which pleased him most. He was also asked to make an inventory of safety hazards encountered in his own environment. This last assignment proved to be as much of an education to our teachers as it did to the pupils. Our teachers tended to think of safety in such vague terms as street safety, or home safety. Our students were much more specific. Fire, electricity, swimming, flies, sanitation, vehicles, camp, were a few of the topics our boys covered. As a final step, a committee of boys and teachers made a survey of safety hazards in Clinton. Their report was mimeographed and posted in each room.

When You Get to New York—When you plan visits to 50 West 50th Street, where the national health agencies are located in Rockefeller Center, you will wish to schedule a stop at New York Museum of Science and Industry. At least if you pass the entrance to the Museum, at the western or 6th Avenue end of the R.C.A. Building, the visible moving displays will draw you inside.

The continuous, but partly changing, displays in the Museum appeal to practically everyone. And there are examples suggestive to everyone concerned with exhibits.

The newest exhibit is the "Story of Man," built by the German Hygiene Museum at Dresden. About 100 units of "action-exhibits and dramatized dis-

plays" illustrate anatomy and physiology. Included are the following: blood circulation demonstration, cell model, embryos, additional spalteholz specimens, flow of the blood, the seat of important body functions in the brain, sleep requirements at different periods of life, organ of equilibrium, mechanism of speech, respiration in rest and motion, work distribution and assimilation in the human body, joint articulation, operation of the digestive system, mastication, cross-section book (carved and painted cross-sections of the body), gland secretion, thyroid gland, organs of the senses, and so on.

Many of the action displays, such as that of the heart which is over-size, are in continuous motion. Others can be set in motion by pressing buttons. There are devices by which each person can test for himself the soundness of his senses and the strength of his muscles. By pressing a button and placing the nose close to an aperture, you can test, for example, your ability to distinguish between such odors as flowery, fruity, putrid, and burnt. A diagram of the tongue enables you to see just where you become aware of the tastes of sweet, sour, salt, and bitter.

And of course there is a copy of the famous "transparent man."

A catalogue of the "Story of Man" exhibits will be sent upon request to the New York Museum of Science and Industry, Rockefeller Center, New York, N. Y.

Publicity Against Syphilis—The recommended anti-syphilis program to be conducted jointly in Indiana by the Medical Association and the Department of Health includes the following:

Since publicity is the essence of salesmanship, it is the opinion of this committee that a very large state-wide committee be appointed. This committee should consist of a physician duly appointed by each medical society in the state of Indiana. It should also consist of every health officer in the state. In addition to this committee, which shall be known as the "state-wide committee," sub-committees shall be appointed by

the state committee members. These sub-committees shall function in the communities in which they exist. It would be well to have in the membership of these sub-committees heads of hospitals, heads of nursing associations, social service workers, such as the head of the Community Fund, Boy Scouts, Girl Scouts, Young Hebrew Association, the Y.W.C.A., Y.M.C.A., Catholic lay organizations, etc. The larger each committee becomes, the greater will be its salesmanship ability in the community. These committees would be able to carry out the plans advocated by the state-wide committee.

Since publicity should be in the hands of the health department, it would be the duty of the state board of health to call the large state-wide committee into session and outline to them the definite plans which have been worked out by the medical association, through its committee for the control of syphilis, and the state board of health. The state committee can place in the hands of the sub-committees valuable information to be distributed in their communities. Through the agency of the state committee members (doctor and health officer) in the community, public meetings can be held with the sub-committees as a nucleus of attendance. Films, exhibits in the nature of poster displays, etc., can be obtained from the state board of health.

In *Journal of Indiana State Medical Assn.*, Hume Mansur Bldg., Indianapolis. Aug., 1937.

The Health Officer Reports—The Public Health Education Section meeting in the A.P.H.A. Annual Meeting are well and generously reported in *The Health Officer* (Nov., 1937), U. S. Public Health Service, Washington, D. C. The report of the opening session brings out the lack of agreement or of understanding as to what health education is or what it should accomplish.

Is it not possible to get a certain number of people to go to a clinic, to be immunized, to give up coffee, and to have a bowel movement every day—in short to adopt certain health practices—without educating? Some people can be belabored or frightened or "campaigned" into action—at least temporarily. Are they any more "educated" to this practice than the majority of automobile

drivers who refrain from parking in restricted areas because they know they'll get a ticket? Hence considering the objectives of health educational effort solely on the basis of the number of clinic attendances, number of diphtheria immunizations, or tuberculin tests seems inadequate. The panel brought forth no other basis for the evaluation of educational effort.

Also in this issue:

"Keeping Up With the Job" (a project in staff training in New York City Dept. of Health) . . . "Education Has 'Quacks' Too" (which should remind us to check up on any new source of information or help in health education).

Health Education in Nov., 1937, Journal—In *American Journal of Public Health*, Nov., 1937:

"Results of Mass Education for Tuberculosis Presentation in Detroit," by Vaughan, Harmon, and Molner (pp. 1116-1123).

"Education in Nutrition by Private Agencies," by Tobey (pp. 1124-1128).

"Results of Publicity" as to venereal diseases (p. 1128).

In "Prevention of Poliomyelitis" (p. 1164) mention of interest aroused by "recent widespread publicity."

Under "Sir Robert W. Philip—World Benefactor" (pp. 1168-1169) are the facts about "a semi-centennial of great social importance."

Under "A National Health Campaign" (p. 1172) is a brief mention of an English effort.

Under "Books and Reports" (p. 1182) see review of "The Traffic in Health."

Three health education items appear in "A Selected Public Health Bibliography" (pp. 1188-1189).

Under "Association News" (p. 1193) are listed 25 new members of Public Health Education Section; "Georgia Public Relations Bureau" (p. 1200); and a new director of health education under "Western States" (p. 1204).

Hygeia, December, 1937—Topics and titles in this issue:

Elixir of sulfanilamide deaths and new legislation (of timely importance) . . . "Chasing the cure" (a review of tb. facts) . . . Slimming scientifically . . . The truth about candy . . . Mates or mismates (what makes the difference) . . . Animals' aid to science (animal experimentation) . . . Paralysis at birth . . . Lighting the schoolroom . . . New books on health . . . Problem child or problem parents? . . . X-rays when cancer comes . . . Your mouth tells of general disease . . . Bad habits in good babies . . . Oliver Wendell Holmes (medical scholar) . . . Questions and answers.

In "School and Health":

Building the health curriculum in the high school . . . Field trips in health education (Camden, N. J., high school) . . . Some of our health needs (a teaching plan) . . . Energy foods for growth . . .

Under "Your Health" are 7 pages on the A.M.A. radio program, with material for school use. The topics are listed through the middle of June, 1938. Reprints of the school material are supplied at 5 cents, 25 for 50 cents. American Medical Assn., 535 N. Dearborn St., Chicago, Ill.

Letters and Good Will—Letters play a large part in both administration and education. In both they have to do with good will. Everybody is doing it—practically all staff members are writing letters. And letter writing is a technical job. It combines writing ability, with a fine sense of public relations. Few of the writers have had training, rules, or advice.

Leaders in business and industry have long been concerned over the quality of the everyday letters which help to create mental pictures of the firm and its business. Extensive campaigns of education and inspiration are conducted among writers of business letters. At last we have a pamphlet on creating good will for health and social work through the everyday letter

writing of the agencies. "Letters and Good Will," by Hilary Campbell, is for every health worker and office worker who writes letters. Social Work Publicity Council, 130 E. 22d St., New York, N. Y., will send a copy for 35 cents.

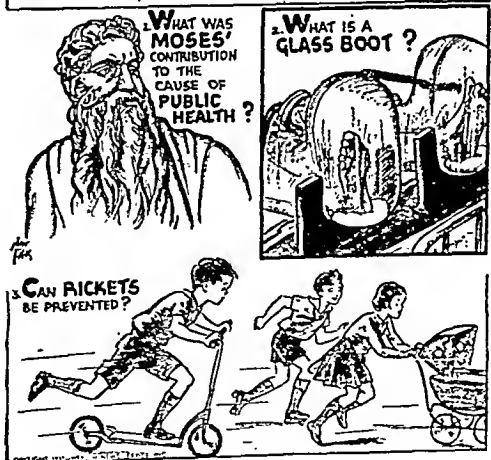
Again if we follow big business, some of us will discuss our letters in meetings of the professional and clerical staffs. A clinic session or a group of recent letters might be highly illuminating. Such chapter headings as "Style in Letter Writing" and "Opportunities to Win Friends" suggests discussion topics, in addition to such as these: "Over-worked words," "What to do about technical words." "What are technical or professional words to the layman?"

Health in Newspapers: Part 2—This month we reproduce a non-comic cartoon series, "What Do You Know About Health?" This is supplied to newspapers by Health News

FIRST CARTOON—Release September 13

What Do You Know About Health?

By FISHER BROWN and NAT FALK



Answers: 1. As a hygienist whose influence has made itself felt throughout the world, and as the first maker of sanitary laws, Moses may properly be regarded as the father of preventive medicine. 2. A contrivance that has worked its miracle of healing in countless cases where frozen feet might have led to gangrene. It has helped many suffering from arterial distension. The glass boot stimulates cir-

ulation by means of gradual and rhythmic alternation of air pressure. 3. Decidedly. No child who gets his necessary quota of calcium, phosphorus and Vitamin D is plagued by rickets—a disease of the bones. Vitamin D is easily obtainable in cod-liver oil, Vitamin D milk and direct sunshine. Calcium and phosphorus have their richest source in milk. Vitamin D milk prevents rickets.

Service. 22 E. 40th St., New York, N. Y.

National Health Library—Located at 50 West 50th St., New York, N. Y., is a coöperative activity of the National Health Council. Is it as generally known as it should be?

It was established in 1922 by the consolidation of the libraries of four of the organizations included in the Council. It is supported by special contributions from member agencies and membership fees. While the collection is primarily for the use of the staffs of the supporting organizations and their members, it is open for reading and reference use, with certain restrictions, by any one interested in public health and allied subjects. The Library now contains about 6,000 volumes, 30,000 pamphlets and 500 periodicals including health bulletins and reports from states and principal cities.

The chief distinction of the National Health Library is its index of current periodical health literature, which is the most complete of any library in the United States. This is kept in the form of a card catalog.

Beside general public health and personal hygiene the main subjects covered are blindness prevention, child health, health education, mental hygiene, nursing, nutrition, personal health, public health nursing, psychoanalysis, sex education, tuberculosis, social hygiene and venereal disease prevention.

The Library does not have any pamphlets for free distribution or sale. It does have available or will compile bibliographies and reference lists on special subjects at a nominal cost.

Loan privileges are granted to those who are individual members of the following supporting organizations: American Public Health Association, American Social Hygiene Association, National Committee for Mental Hygiene, National Organization for Public Health Nursing, National Society for Prevention of Blindness, National Tuberculosis Association.

Others pay an annual fee of \$3. There is also an annual corporate membership of \$10 which permits, in addition to the privilege of borrowing books, special use of the Library, with certain restrictions.

Every Friday there is issued a four page mimeographed *Library Index* in which reference is made to the more important and interesting articles appearing in the current magazines received in the Library. Refer-

ences are included to city and state health bulletins not indexed in any other place. The subjects used are the same as those covered by the Library collection. The annual subscription is \$2.50 for those not on the staff of the supporting agencies.

The Library is open from 9 to 5 Monday to Friday; 9 to 1 Saturdays. Isabel L. Towner is Chief Librarian; Eva R. Hawkins, Associated Librarian.

MOTION PICTURES

The annual awards for the best amateur movies of the year include two by dentists, each presenting technical dental material. Such awards may suggest anew that there are possibilities in amateur films as teaching material for local as well as state staffs, and groups of coöperating agency staffs. The "best" pictures are described in *Movic Makers*, 420 Lexington Ave., New York, N. Y. Dec., 1937.

"1000 and One: The Blue Book of Non-Theatrical Films." The most extensive list of such films, on a wide range of subjects, with number of reels, content, nature of film, distributors, prices. Includes: embryology, anatomy, and structural physiology, eyes, feet, teeth, hair, child hygiene, food, personal hygiene, public hygiene, safety and accident prevention, fire prevention, nursing, first aid, life saving, disease and its treatment, medicine and surgery, parent education, psychology. *Educational Screen*, 64 E. Lake St., Chicago, Ill. 100 pages. 75 cents; 25 cents to subscribers to the magazine.

"Public Health in New York State" is the movie answer to those who ask what the State Department does. The picture runs about 20 minutes; is available in 16mm. and 35mm.

This is the first motion picture with sound produced entirely by the department through its Division of Public Health Education. It is developed around the district plan of health organization, with emphasis on the work of various divisions, as it is administered through the district health officers. Activities of 8 of the divisions are presented in detail, while work of the remaining 4 is covered in outline.

"What's in a Dress" is a new movie of the Woman's Bureau, Washington, D. C. It is a silent picture, and loaned, either narrow or standard width, to any interested organization willing to pay the nominal transportation charges both ways. In this review of problems in the clothing industry, sweat shop work in a tenement is pictured.

Among resolutions passed at the 1937 meeting of the Department of Visual Instruction, N.E.A., was the following:

WHEREAS, the Visual Instruction Department deplors the indiscriminate use of motion pictures in the school, therefore, be it

RESOLVED, that it urges greater attention be given by school toward securing and using only those motion pictures which are suited to the mental and maturity levels of pupils, and be it further

RESOLVED, that the department recommend that greater care be taken to distinguish more clearly between motion pictures used for specific classroom purposes and those more general motion pictures useful for auditorium or assembly activities.

The extent to which big business is making use of the motion picture is illustrated in a recent magazine advertisement. There were included pictures of the 212 sound projectors bought by one well known firm, the 110 projectors sold to another, the 104 to a third, and so on.

"Getting Started with Titles" is a brief, informal account of how one man undertook to make his own movie titles. Others may benefit by his experience. *Movie Makers*, 420 Lexington Ave., New York, N. Y. Dec., 1937. 25 cents.

In this department we have urged motion picture production as a health education project in schools. Now we have "The Movie Club as a Visual Education Project," by L. C. Spire. Tells how a club was organized to back the whole school curriculum; how the

costs are met by public exhibitions. In *Educational Screen*, 64 Lake St., Chicago, Ill. (Nov., 1937; 25 cents):

The equipment for producing 16mm. films is not elaborate or costly. Excellent cameras may be purchased for about the same price as a good snapshot camera. All of the other accessories including tripods, tilting stands, developing reels, and tanks, can be made. Our total outlay, exclusive of camera and projector, was less than \$5. This outlay enabled us to film pictures suited to our own particular needs which could not be procured elsewhere at any price. The possibilities are practically unlimited.

Is it within the scope of high school boys and girls? The films are of vital interest to them and they take pride in the making of their own movies. Has the club any value to the school and to the boys and girls of the club? The films are educational in nature and are produced to meet the particular needs of the classroom teacher. It would be difficult to over-estimate the value to the club members. . . .

SCHOOLS AND CHILDREN

"Alcohol and Narcotic Drugs," by Dr. Haven Emerson. *Journal, National Education Assn.*, 1201 16th St., N.W., Washington, D. C., Sept., 1937. 25 cents. "An urgent problem in health education"—and why.

"Evaluation of a Rural School Health Education Project," by Strang, Grout, and Wiehl. First of a series dealing with evaluation of the experimental school health education project in Cattaraugus County rural schools. *Quarterly*, Milbank Memorial Fund, 40 Wall St., New York, N. Y. Oct., 1937. 25 cents.

"Dental Health in Elementary Schools." Massachusetts Dept. of Public Health, Boston. Facts, teaching principles, teaching materials; table of contents and index. For teachers who need help most the reference lists could have been annotated to advantage. As is so frequently the case, although addresses are given for book and pamphlet publishers, periodicals are listed without addresses.

"Headed for Healthful Living," by M. B. Rappaport. *Journal of Health and Physical Education*, Ann Arbor, Mich. Nov., 1937. 35 cents. Outlines 8 essentials in a health teaching program; describes some applications in typical schools. Also: "A Sex Education Program," by H. C. Leibee. Reviews the need; states a wide range of community and school activities in education and prevention. In "Healthy Endings," H. T. Smith describes a "health game" or knowledge test which we should like to see in use among adults as well as children. A set of sentence beginnings parallel a set of endings, but not in the same order. Problem: which ending goes with which beginning. To use in classroom or elsewhere the two parts might be offered on written or mimeographed sheets. Or, the children might draw or cut out illustrations, mount them on cards, so that the two sets could be matched. Or, as an exhibit, the endings might be mounted on two revolving drums, mounted side by side, so that visitors could match them, a matched set to be supplied to every one who makes the try.

"Preparing Future Citizens to Support Public Health Measures," by Sally Lucas Jean. *Education*. May, 1937. Adequate school health examinations, and effective teaching of personal and public health needed if future citizens are to value properly public health services. Reprint from the author: 200 Fifth Ave., New York, N. Y.

In *Public Health Nursing*, 50 W. 50th St., New York, N. Y. (35 cents):

Sept., 1937: "Building for Health in a Secondary School" . . . "Health Explorations of Eighth Grade Children" . . . "The Nurse's Contribution to Health Education" . . . "New Ways for Old in Rural School Health" . . . "Present Trends in Health Education."

Oct., 1937: "Approaches to Sex Education in the Schools" . . . "Who Is Prepared to Teach Health?"

Nov., 1937: "Habit Training During the Preschool Years."

REPORTING

As usual the opening feature of the East Orange, N. J., Board of Health report is a diagram based on the *Appraisal Form*. Here we have the total score of 932, and the details in black and white bars for vital statistics, infant hygiene, etc. Popular health instruction is missing, but gets two pages of text, and a photograph of the Information Room, "to which the public first comes as it enters the building" and which "continues to serve a useful part in education."

The annual report of Visiting Nurse Assn., 205 W. Main St., New Britain, Conn., is printed on one sheet which is folded so that it makes 12 pages, 3½ by 9 inches, with a 3 page spread of pictures entitled "Serving New Britain in Sickness and Health." One page is used for the mailing addresses.

Health, Lansing, Mich., for Oct., 1937, is an extensive, profusely illustrated number commemorating the 30th anniversary of the Michigan Tuberculosis Association.

"The Health of Madura City," reports activities of the Health Department of that far southern India community. The health education record includes cinema shows (510), magic lantern demonstrations (288), lectures and talks (3,847), each about doubling over the preceding year.

The mimeographed report of the Los Angeles, Calif., County Health Dept. explains that the Bureau of Maternal and Child Hygiene "is largely an educational activity in instructing mothers in the proper care of their children, as well as many other types of maternal and child health problems. For this reason a great deal of work is done with schools, women's clubs, and organizations of a similar type."

"A New Day Dawns for Birth Control" is the "concluding report" of the National Committee on Federal Legislation for Birth Control, 17 W. 16th St., New York, N. Y. This "summary of 7 years which led to legalization and cleared the way for an epoch-making advance" is largely a record of education, propaganda, and of legislative effort—which is largely educational.

Possibly the simplest form of annual report to be mailed without an envelope is that of the Public Health Nursing Assn., 519 Smithfield St., Pittsburgh, Pa. Concise report paragraphs are headed: "Highlights," "We Point With Pride," "We View With Alarm," "We Look Ahead."

A two year report makes up the Oct., 1937, issue of *Bulletin*, American Society for the Control of Cancer, 1250 6th Ave., New York, N. Y. There are paragraphs on exhibits, talking film slides, and film strips issued by the society.

The 1936 report of the Newton, Mass., Health Dept., contains a two page table of contents, with all sub-headings under the main chapter headings. This seems more useful in a small city report, than the index which is so needed in the reports of larger cities and states. Health education includes professional, nursing, and general. Under the last is brought out the limitations experienced in the smaller city overshadowed by a big neighbor. The last chapter is made up of brief reports of health work by local voluntary agencies.

"Report for the First Half of 1937 on the Project of Arousing and Developing Citizen Interest in and Support of Work for the Control of Syphilis in New York State, outside of New York City." An 11 page mimeographed report of the State Committee on Tuberculosis and Public Health,

S.C.A.A., 105 E. 22d St., New York, N. Y. This report may serve as a useful check list illustrating the range of activities and educational materials to be drawn upon by other health agencies.

"Statement of Membership and Activities, 1937-1938," National Health Council, 50 W. 50th St., New York, N. Y. Reporting the N.H.C., with a page or two on each of the member agencies, national health associations, their nature, services, etc.

When "contents" may fail to grasp its opportunity for usefulness is illustrated by a department of hospital report. The "contents" reads:

Introduction, page 6; Divisions, page 7; Institutions, page 43; Capital Outlay Budget, page 78; Coöperating Groups and Agencies, page 82; Department Progress, page 89.

There are 28 divisions, and 29 institutions to be located by the above "contents," without an index.

DATES AHEAD

Sometimes you get health agencies represented on committees for celebrations conducted by other groups. Sometimes a press release, an interview, the caption to a photograph, will make a health tie-up. Or you may send a letter of suggestion which carries over your idea. Again, a little celebration by your own staff may serve the purpose.

International Leica Exhibit, Jan. 8-15, 1938, International Bldg., Rockefeller Center, New York, N. Y.

Jan. 17 and 18, 1938, Conference on Better Care for Mothers and Babies. U. S. Children's Bureau, Washington, D. C.

Jan. 22 is anniversary of organization of first free school dental clinic in America. Consult Children's Aid Society, New York, N. Y.

Child Labor Day, Jan. 29, 30, or 31, 1938. Write National Child Labor Committee, 419 4th Ave., New York, N. Y. Send 25 cents for packet of child labor literature.

Feb. 2, 1938, will be the second *National Social Hygiene Day*. Address: American Social Hygiene Assn., 50 W. 50th St., New York, N. Y.

Candlemas or "Ground-Hog Day," Feb. 2. Whether it does, or does not!

Feb. 10, anniversary of *opening of first modern hospital*. See "News Almanac for Social Work" (Community Chests and Councils, 155 E. 44th St., New York, N. Y.). Consult American Hospital Assn., 18 E. Division St., Chicago, Ill.

Feb. 13, 1938, *Race Relations Sunday*, introducing *Interracial Week*. Address: Dept. of Race Relations, Federal Council of Churches, 297 4th Ave., New York, N. Y.

St. Valentine's Day, Feb. 14, may be given a health slant.

May 15, 1938: Closing date for Competition in Small Sculptures in White Soap. Address: National Soap Sculpture Committee, 80 E. 11th St., New York, N. Y. For students, sanatoria patients, and others.

FOR REFERENCE OR EDUCATION

Of course the notes which appear from time to time under this heading should be classified, and more fully annotated. Satisfactory classification for all the audiences among our readers is not possible here. What could be educational in one group would be quite out of place with another.

We here seek to do little more than to make the wide range of material accessible to planners, writers, executives, teachers, and others, who in turn may be expected to select and to describe what will best serve the needs of their respective groups.

Again we would suggest that a single copy, or a half dozen copies, of a selected publication may be used to splendid advantage toward interesting an influential individual, or in helping the leader of a group.

"The A-B-C of Syphilis." New Jersey State Dept. of Health, Trenton. 7 pp. "What the average person should know about a very dangerous and prevalent disease" appears on cover page. Examples:

Accidents are often the direct result of Syphilis.

Advertised drugs for self-treatment of Syphilis are dangerous. Avoid them.

Adequate medical treatments are the only way to cure Syphilis.

Alcohol and Syphilis are close companions.

Again C. LeRoy Baldridge, so well known for his posters and book illustrations, has painted a poster for the N.O.P.H.N. A public health nurse at the door of a home being welcomed by the children—beautifully executed in four colors on fine quality heavy stock. There is space in which to localize poster. 50 cents; 12 or more, 25 cents. N.O.P.H.N., 50 W. 50th St., New York, N. Y.

"Citizen Support in Syphilis Control," by Homer Folks. *Venereal Disease Information*, Supt. of Documents, Washington, D. C. Oct., 1937. 5 cents. How individuals and groups cooperate to advantage.

A clever use of humor to point a health moral is to be found in a reprint, "Thank God for Lip-Rouge," from *Health Officers News Digest*, 30 Rockefeller Plaza, New York, N. Y. Free. An effective adaptation has been made in the form of a display card 11 by 14 inches.

"Equipment for a Nursing School Library," by S. T. Smith. *Am. Journal of Nursing*. Aug., 1937. May be useful outside of the nursing school field.

"Experimental Syphilitic Keratitis in the Rabbit," by Dr. A. J. Gelarie, 52 W. 74th St., New York, N. Y. Reprint.

From "abscess" to "yellow fever," from the communicable diseases of childhood to the trend of longevity, a wealth of statistical reference data is contained in "Twenty-Five Years of

Health Progress," by Louis I. Dublin and Alfred J. Lotka. Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y.

"Low Cost Food for Health." An attractive looking pamphlet of 75 pages with food, meal, marketing, and cooking information; two-thirds devoted to recipes; a detailed table of contents for the recipes in the back (even though it happens to be labelled "Index"). Community Health Assn., 137 Newbury St., Boston, Mass. 25 cents?

"Maternal Care," by Dr. F. L. Adair, University of Chicago Press, Chicago, Ill., for American Committee on Maternal Welfare. Basic principles for the professional.

"Milk Control: Governmental Regulation of the Dairy Industry in the U. S." Public Administration Service, 850 E. 58th St., Chicago, Ill. 75 cents. What federal, state, and local agencies are doing; regulations; laws, surveys, etc.; special chapter on publicity and educational work.

"Need for More Nutrition Education." Dairy Council Digests, National Dairy Council, Chicago, Ill. Free.

"Practices and Experiences of the Lavanburg Homes." Lavanburg Foundation, 132 Goerck St., New York, N. Y. A housing experiment for the real "slum" dwellers.

"Public Health Work Helps Private Practitioners," by F. M. Houser, M.D. *Health Bulletin*. State Board of Health, Raleigh, N. C. Dec., 1937. A good case is made for public health departments.

"Transiency: A Public Health Menace." Tuberculosis Abstracts, National Tuberculosis Assn., 50 W. 50th St., New York, N. Y. Oct., 1937.

A triple letter-sheet spread of well arranged newspaper clippings. Henry Street Visiting Nurse Service, 99 Park Ave., New York, N. Y.

"Vitamin Content of Foods," by Daniel and Munsell. Supt. of Docu-

ments, Washington, D. C. 15 cents. Professional study.

"The Wonderful Story of Life." U. S. Public Health Service. A parent's talks with children regarding life and its reproduction. Supt. of Documents, Washington, D. C. 18 pages. 10 cents.

List of publications. Social Work Publicity Council, 130 E. 22d St., New York, N. Y. Dec., 1937. Free.

American Medical Assn., 535 N. Dearborn St., Chicago, Ill.:

"Gonorrhea," by Warner and Warner, and "The Gonococci," by H. L. Herschensohn. 15 cents. . . . "Syphilis," by Warner, "Spirochaeta Pallida," by Herschensohn, and "The Wassermann Test," by Kolmer. 15 cents.

American Social Hygiene Assn., 50 W. 50th St., New York, N. Y.:

"Prostitution in the U. S.," by Bascom Johnson. 10 cents. 18 pp. . . . "A Current View of Prostitution and Sex Delinquency," by Bascom Johnson. 10 cents. 14 pp. . . . "What You Should Know About Syphilis and Gonorrhea," by M. J. Exner. 72 pp. 15 cents. . . . "The Newest Generation," by William F. Snow. 10 cents. 9 pp. . . . "The Drama of Syphilis," by C.-E. A. Winslow. 10 cents. 16 pp. . . . "Social Hygiene and the Public Mind," by David Resnick. 10 pp. 10 cents. Reviews progress against syphilis discussion taboo.

Children's Bureau, Washington, D. C.:

"Home Play and Play Equipment" . . . A group of separate charts and tables on maternal mortality for statements comparing cities and states, etc. . . . "A General Plan and Objectives of a Maternal and Child Health Program" (reprint) . . . "Suggested Methods of Improving the Health of the American People" (reprint) . . . Development of a Leisure-Time Program in Small Cities and Towns." . . . "Esta Vd. Educando a Su Nino a Ser Feliz?"

National Tuberculosis Assn., 50 W. 50th St., New York, N. Y.:

"The Tuberculin Test" (4 p. folder).
"The Double-Barred Cross: Symbol of the World-Wide Campaign Against Tuberculosis" (3 p. folder; significance, history, and use).

Reprints (10 cents each) from *Public Health Nursing*, 50 W. 50th St., New York, N. Y.:

"Community Partners" (chests and v.n. assns.) . . . "Study Outline: Lay Participation in Public Health Nursing" . . . "Building for Health in a Secondary School" . . . "New Ways for Old In Rural School Health" . . . "A Program for Staff Education: Pneumonia."

CONVENTIONS: PAST AND FUTURE

At the *sixty-third annual meeting* of New Jersey Health and Sanitary Assn.: A continuous program of 12 motion pictures . . . microscopic exhibits by Bureaus of Venereal Disease Control and Bacteriology of State Dept. of Health . . . "Health Education in Its Broader Aspects," by Dr. Livingston Farrand. From *Health Progress*, Freehold, N. J. Nov., 1937.

On the program of the annual Illinois State Conference on Public Health: "Community Education in Communicable Disease Nursing."

Why not do something about the next state meeting of social workers, or any state or national meeting of health workers? Why not have a health education and publicity session? Breakfast, luncheon, or informal dinner?

If you have no other idea for a program offer "Question and Answers." Invite questions in advance. Have your questions written out ready to start the meeting. The audience will quickly supply more questions. The chairman can answer some questions and get the audience to help. A committee of two or three could help the chairman handle the questions.

Merely opinion questions could be answered by raising hands. How many believe so and so? How many believe something else?

MAGAZINE ARTICLES

"Condition Satisfactory," by Dr. Sandor Pudor. A Viennese physician has written of his own physical and psychological reactions to three operations. "Sight Without Glasses," by Dr. H. W. Peppard. The use of exercises. "Man, Bread and Destiny," by Furnas and Furnas. What man does to food; what food is doing to man. Condensed in *Book Digest*, 350 E. 22d St., Chicago, Ill. Dec., 1937. 25 cents.

"The Heritage of Ignorance," by G. Zilboorg. *Atlantic Monthly*, Boston, Mass. June, 1937. 40 cents. Includes psychiatry. Quotes Artemus Ward on ignorance as not lack of knowledge, but as "knowing so many things that ain't so."

"Hope for Crippled Children," by Dr. W. R. Ramsey. *Farmers Wife Magazine*, St. Paul, Minn. Dec., 1937. A copy free to a health worker.

Life, in its Nov. 29, 1937, issue gave 8 pages to tuberculosis and the Christmas Seal. The publishers sent a copy to each state tuberculosis association and tuberculosis sanatorium.

Six picture pages about tuberculosis (including a half page picture from that time when tuberculosis patients "drank the blood of freshly slaughtered cattle to give them strength"); and 2 pages of open-air treatment in Europe; 3 pages of fire and water life saving; 16 facts about bathing a baby. *Look*, Des Moines, Iowa. Dec. 7, 1937. 10 cents.

"Syphilis." Two book reviews by Ira V. Hiscock. *New Republic*, New York, N. Y. Oct. 6, 1937. 15 cents.

Reviews of the current books on syphilis have added immensely to the magazine and newspaper space given to the subject.

BOOKS AND REPORTS

Clinical Parasitology—By *Charles Franklin Craig, M.D., Colonel U. S. Army (Retired), and Ernest Carroll Faust, Ph.D.* Philadelphia: Lea & Febiger, 1937. 733 pp. Price, \$6.50.

This new textbook by leading American authorities on tropical medicine and parasitology from the Tulane University School of Medicine is intended for practising physicians, medical students, and other students of these subjects. It is a well balanced volume covering the fields of protozoology, helminthology and entomology as they apply to the animal parasites of man and their vectors. It is divided into three sections, one for each of the above divisions of the field, and is supplemented by an appendix describing the technic of collection, preparation and identification of the parasites, and giving a list of representative specimens desirable for teaching and the *International Code of Zoölogical Nomenclature*. Finally, there is an extensive reference list of textbooks, journals, and references to the subject and a complete index.

Colonel Craig has prepared the section on protozoa and Dr. Faust the sections on helminths and arthropods. Each section is introduced by a general consideration of the morphology, biology, and classification of the parasites concerned, and each sub-group of parasites is introduced by a zoölogical classification. The individual parasites are treated from the historical, geographical, and morphological points of view; their habitats, life histories, and epidemiology are described; their pathological effects on the host and the clinical symptoms produced are presented; and methods of diagnosis described, followed by a consideration

of treatment and prevention. The many previous first-hand studies and publications of these authors in their respective fields and their activities in teaching and research work up to the present time have insured a completeness of authoritative and correct presentation of facts which could hardly be exceeded at the present time. Colonel Craig has especially drawn upon his expert knowledge of amebiasis and malaria, using much of the material on amebiasis which appeared in his recent volume *Amebiasis and Amebic Dysentery*, and Dr. Faust has reproduced and brought up to date much of the subject matter in his volume *Human Helminthology*.

The value of the book is enhanced by a judicious use of tables and by 243 engravings, both original drawings and photographs, and many others borrowed from other publications. The book is remarkably free from statements of doubtful facts, argumentative points, and typographical or editorial errors.

The reviewer is in agreement with nearly all of the points of view expressed as far as his familiarity with the subject is concerned. In the consideration of the pathology of visceral Leishmania infection more emphasis might have been placed upon the almost exclusive participation of the reticulo-endothelial cells throughout the body and the paralyzing effect of the infection on the bone marrow, producing a reduction in platelets and a prolonged bleeding time as well as a secondary anemia and leukopenia. In the treatment of Leishmania infections the modern use of pentavalent antimony preparations replacing the use of tartar emetic might have received

greater emphasis. In the treatment of hookworm, carbontetrachloride is listed among the drugs advocated without emphasizing its occasional fatal toxicity and without warning against the use of fats and alcohol in the diet close to the time of administration. Preliminary purging is advocated in connection with all anthelmintics although it is generally conceded that this is unnecessary with some anthelmintics and is often harmful with carbontetrachloride. In connection with the bite of the black widow spider the statement is made that the site of the bite becomes red and swollen, whereas in the reviewer's experience there is usually no local inflammation whatsoever. The rise in blood pressure associated with this condition, which is of diagnostic importance, is not mentioned.

The book is beautifully printed and bound and both the authors and the publishers are to be congratulated on its accomplishment. It will undoubtedly become a standard textbook in its field.

HENRY E. MELENEY

Feeding Behavior of Infants—By *Arnold Gesell and Frances L. Ilg*. Philadelphia: Lippincott Co., 1937. 201 pp. Price, \$4.50.

With characteristic thoroughness and scientific precision, Gesell and Ilg have produced a book which should be of absorbing interest to physicians, nurses, and educators. Strictly speaking, it is not a book on infant feeding. Feeding is simply one of the behavior reactions in the growth of the total personality of the child. The authors succinctly describe the volume as "A Pediatric Approach to the Mental Hygiene of Early Life."

The book incorporates the results of an enormous amount of research carried out through the Yale Clinic of Child Development in coöperation with the Visiting Nurse Association and the

Well Baby Conferences of New Haven. The same use of pictorial illustrations is made as was used so extensively in Gesell's *Atlas of Infant Behavior*. One hundred and thirty-two well selected, unique photographs are included in the present volume.

Part I treats of the behavior aspects of nutrition, Part II of the growth of feeding behavior, and Part III of the regulation of feeding behavior. An appendix rounds out the volume with interesting and instructive illustrative biographies of actual feeding cases. A selected bibliography of the important contributions in this field increases its usefulness. The book is well arranged for reference and is beautifully printed.

RICHARD A. BOLT

Anatomy and Physiology of Physical Training—By *Major R. W. Galloway*. Baltimore: Wood, 1937. 182 pp. Price, \$2.50.

This brief, condensed treatise attempts to cover in Part I the principles of anatomy and physiology as related to physical training. Part II presents the practical application of these principles to training.

Among others, it has a chapter on breathing exercises and one on corrective exercise. Its major objective is in the field of body mechanics. It seems too sketchy to give real grounding and application.

CHARLES H. KEENE

Some Fundamental Aspects of the Cancer Problem—Edited by *Henry B. Ward*. New York: Science Press, 1937. 248 pp. Price, \$2.50.

The general interest in cancer has led to the publication of this supplement to Volume 85 of *Science* containing 31 papers or abstracts of papers read at the Atlantic City meeting in December, 1936. The first group concerns heredity and constitutional fac-

tors. Maud Slye summarizes her work with the statement that malignant disease is transmitted through the genes as a recessive character and that carcinoma, sarcoma and leukemia have different general and localizing characters. She believes that there is no evidence of the operation of an extra-chromosomal factor.

On the other hand, C. C. Little believes the evidence shows that the most important influence in determining the incidence of breast cancer, although it has a genetic basis, is evidently affected by factors of the internal environment and that evidence is steadily accumulating to support the hypothesis advanced by Tytzer in 1915 that the cancer cell differs from the normal by a process of mutation.

Clara Lynch believes that the results of her studies on spontaneous lung tumors in mice shows that heredity plays some part in controlling the appearance of tumors in this organ.

On the other hand, the very extensive work of Bullock, Curtis, and Dunning, studying tumors produced by known agents such as cysticercus larvae, a parasite which develops in the liver, and also some of the carcinogenic hydrocarbons, points to the fact that the possibilities of cancer development must be a universal cell characteristic and that the histogenesis of the tumors is determined by the fortuitous exposure to an irritant of the various types of cells which characterize neoplasms in general.

F. C. McDowell concludes that the incidence of leukemia is determined by intrinsic and extrinsic factors, but he also shows that even in a genetically uniform strain of leukemic mice not all develop the disease.

The second group of papers discusses the artificial production of tumors and is prefaced by a paper on the synthesis of a large number of fairly simple

hydrocarbons contained in the phenanthracene group.

F. C. Wood discusses the great variety of tumors which have been produced in animals and calls attention to the fact that it has not been possible as yet to produce neoplasms in cells growing in culture though exposed to a potent carcinogenic agent.

R. S. Ferguson calls attention to the fact that the malignant tumors of the testes are neoplastic growths of the germ cells and hence give rise to tumors of a teratoid nature.

H. J. Bagg follows with a demonstration of the production of a teratoma in the testicle of the fowl by the injection of a zinc chloride.

J. B. Murphy reports on his studies of the stimulating and inhibiting agents obtained by the use of various cell extracts.

Finally, the volume contains a series of studies on the production of high voltage radiation, the determination of X-ray qualities by filters, comparative effects of neutrons and X-rays on tissues, biological effects of alpha particles, and ends with some excellent statistical and general papers. The whole offers a good cross-section of cancer research at the present time.

FRANCIS CARTER WOOD

Malaria in Europe — By L. W. Hackett. New York: Oxford University Press, 1937. 336 pp. Price, \$3.75.

Dr. Hackett's book is a valuable contribution to the book-shelf of the malarialogist, the physician, the public health worker, and the layman interested in controlling the disease. The style is delightfully easy and the illustrations are well chosen.

Although Dr. Hackett has thoroughly documented his narrative and demonstrated his points by citing other experiences as well as his, yet he presents his theories and conclusions as entirely

his own. This lends much to the clarity and value of the book.

In discussing the epidemiology of malaria, showing its dependence upon the relation of the habits of the insect carrier to the habits of man, Dr. Hackett discloses the distinctive habits of the newly discovered races of *A. maculipennis*. In describing the ebb and flow of the disease in Europe through the centuries, he recounts briefly the controversies over anophelism without malaria and over zoöphilic barriers as controls. He shows how the recently acquired knowledge of the distribution of each race of *maculipennis* ends these controversies.

The complexity of the malaria parasite and the rôle of immunity are delightfully treated. His discussion of the variation of strains within each species of plasmodium clears up many misconceptions by giving accurate descriptions of parasite reactions to given treatments. We welcome such a brief resumé of a voluminous literature.

All physicians in the South and all malariologists should read the chapter on "Treatment in Theory and Practice." Those interested in attempts to control malaria infection rates by means of any anti-malaria drug should carefully study it. Here is given a well digested view of the rôle, dosage, and duration of treatment of each of the anti-malarials and their respective efficacy for each species of plasmodium as well as a clear discussion of cases which depart from the rule. He differentiates between temperate climate malaria (with a winter season of no transmission) and the same disease with its different manifestations under tropical conditions. He explains clearly how to appraise a malarial situation and summarizes the determining factors in selecting a method of control for any malaria project.

Dr. Hackett discusses what results may be expected from drainage,

larvicide application, or screening, without distracting the reader's attention by lengthy descriptions of the minutiae of each method of anopheline control.

The book concludes with two thoughtful illustrations of unusual though logical methods of meeting two different malaria situations—solutions arrived at from a careful study of epidemiological data rather than the haphazard application of any standard control measure.

LOUIS L. WILLIAMS

Childbirth Yesterday and Today
—By A. J. Rongy, M.D. New York: Emerson, 1937. 192 pp. Price, \$2.00.

Safely Through Childbirth—By A. J. Rongy, M.D. New York: Emerson, 1937. 192 pp. Price, \$2.00.

These companion volumes give a concise description and a clear picture of the progress of midwifery and obstetric practices throughout the centuries. They elucidate step by step the application of scientific methods to the solution of difficulties encountered in childbirth.

The historical narrative is presented delightfully and is illustrated with telling pictures. A sketch of the history of child care with reference to the father as well as the mother makes interesting and instructive reading. Brief, well balanced chapters on birth control and childbirth today are included.

Safely Through Childbirth is a practical small volume on prenatal, natal, and neonatal physiology and hygiene. It describes in non-technical language the changes involved in the organism in motherhood, stressing the importance of prenatal and postnatal care. A timely chapter on abortion is included.

The convenient size and composition of these two volumes should assure them a place in the educational efforts

now being made for the prevention of maternal mortality and morbidity.

RICHARD A. BOLT

Textbook of Psychiatry—By Arthur P. Noyes, M.D. (2nd ed.) New York: Macmillan, 1936. 329 pp. Price, \$2.50.

This book does unique justice to the field of psychiatric nursing and, indeed, in synoptic form, to the broad field of general psychiatry. This second edition represents a thorough revision of the previous text. Not only does this book pay respect to increasing knowledge which has been rapidly enhancing psychiatric usefulness, but also gives a commendable psychiatric attitude and insight which may be termed "constructive psychiatric intelligence."

Of particular note is the attention paid to the common maladjustments of life, the significance of behavior and personality manifestations observed in the wards and clinics of general hospitals as well as those in connection with mental hospitals. The author's conception of mental health as a real and individualistic matter, together with emphasis upon the integration concept, is indeed noteworthy.

The nurse's own rôle is understanding her personality development not only from the standpoint of self improvement or social adjustment and individual efficiency but also because of her influence upon the lives of those she serves, receives critical amplification in the final chapter, *The Nurse and Her Profession*.

The explicit style of the writer makes the reading of this text both interesting and easy to grasp. The genetic-dynamic approach to each of the subjects discussed is in keeping with present-day psychiatric knowledge and practice. The author is wholesomely eclectic in his attitude toward the various schools of psychiatry but seeks to bring to the surface the core of their respective

contributions in the light of possible usefulness to the nurse.

A well chosen glossary and index conclude the book. The references for further reading at the end of each chapter have been critically chosen although certain typographical errors in respect to names no doubt will be corrected in succeeding revisions.

FREDERICK L. PATRY

Junior Clothing—By Kate W. Kinyon and L. Thomas Hopkins (rev. ed.). New York: Sanborn, 1937. 262 pp. Price, \$1.16.

Once there was a book *Junior Foods and Clothing*. Now each subject has been elaborated into a separate book. *Junior Clothing* is a 9 chapter textbook for use in junior high school home economics classes. The subjects developed are use, appearance, design, color, textiles, under-garments, selection, repair, and how to fit the clothing problem into the family scale.

Within the clothing situation as it now exists, these titles are developed in great detail even unto "rhythm in arranging lines and spaces." The text, however, makes no attempt to correct existing foolish practices, as for example, why men should slavishly continue to wear neck-choking shirts and ties, heat-retaining vests and coats, and monkey jackets. Most of the book, unfortunately, is for that sex which is already too far ahead of the other in matters of health, comfort, variety, and particularly appearance of clothing. The authors missed an opportunity to help the mere males. W. W. PETER

Junior Foods—By Kate W. Kinyon and L. Thomas Hopkins (rev. ed.). New York: Sanborn, 1937. 362 pp. Price, \$1.16.

This is a companion book to *Junior Clothing*, and is likewise designed for general use as textbook in junior high school home economics. The 8 units

cover necessary foods, breakfast, lunch, dinner-choices, the why of preserving foods, food purchasing, cooking utensils, recipes in food preparation.

The authors have stood commendably adamant against yielding to the ballyhoo of Hollywood diets, food faddists, and some of the more insidious council-approved commercialized food advertising. An example is the subject of vitamins so vitally invigorating to all of us, especially to various manufacturers. It is strenuous enough for even the professionally trained to keep up with the vitamin procession. The authors have fortunately avoided confusing children's minds with too much technical material. They mention the alphabetical list of vitamins, tell what regulatory stunts they perform in the body, list the variety of overlapping foodstuffs harboring these elemental substances, and let it go at that before all interest on the part of the child is lost. In like manner the essential salts are reviewed.

The illustrations are particularly interesting because the subject of food use lends itself to startling photographic contrasts—big and little rats, pigs, dogs, and children, all snapped just as they stand to show the difference between right and wrong feeding.

There is so much good material in this book that one can forgive the continued use of doubtful material such as the 4 pages of height-weight-age tables for boys and girls lifted from ancient traditional sources and printed without reference to variations due to racial stock and physical build.

W. W. PETER

Principles and Practice of Public Health Dentistry—By J. A. Salzmann, D.D.S. Boston: Stratford, 1937. 584 pp. Price, \$4.00.

As far as our reading goes, this book in its entirety covers a new field, or perhaps it is more correct to say that

the author has gathered and put under one cover subjects which until this time it has been necessary to search for through quite extensive literature.

"Dental public health is presented from an evolutionary standpoint in Part I; from the professional viewpoint in Part II; from the viewpoint of Public Health in Part III; while Part IV constitutes a handbook on dental public health practice." It would be hard to say which of these is the most interesting. It is perhaps safe to say that the first part covers ground which is less generally known to the medical profession, at least, than the others. Parts II, III, and IV are eminently practical, but also contain a great deal of history, especially Parts II and III.

From the standpoint of the readers of this *Journal*, probably Part III, which deals with the public health aspects of dentistry, is the most important, but all hang together to make an excellent whole. Part IV gives the program for dental public health, which is well thought out and practical. It contains chapters by Dr. Harry Strusser, Chief of the Dental Division, Bureau of School Hygiene of the Department of Health, New York City; and by Dr. John Oppie McCall, Director of the Murry and Leonie Guggenheim Dental Clinic.

We consider this book one of unusual value, which we hope will be read by health officers and public health workers generally. It is a strong plea for the recognition of oral hygiene and dentistry in our programs of public health. The author emphasizes, very properly in our opinion, the discoveries of dentists and the part they have played in proving the relationship of the condition of the mouth and teeth to the general health. It is true that in some ways they have in the past gone too far, but a better understanding of their attitude and facts on the part of the medical profession might have

saved us from the orgy of tooth pulling for the cure of every ailment to which flesh is heir—now happily a thing of the past.

The book is well and interestingly written. The author does not hesitate to show up some of the failures of the profession in the past, but, as already pointed out, also tells us of its triumphs and sacrifices, which mark it as a decidedly human document.

The illustrations are excellent and the book is well documented, with a bibliography at the end of each section. A good index adds to the value of the book. We wish for it a wide circulation among all public health workers and health officers, and also in the medical profession.

MAZÛCK P. RAVENEL

Research Memorandum on Social Aspects of Health in the Depression
By Selwyn D. Collins and Clark Tibbits. New York: Social Science Research Council, 1937. 192 pp. Price, \$1.00.

Research Memorandum on Crime During the Depression—By Thorsten Sellin. New York: Social Science Research Council, 1937. 133 pp. Price, \$1.00.

These two volumes are part of a series of 13 monographs on the social aspects of the depression published by the Social Science Research Council under the direction of its Committee on Studies in Social Aspects of the Depression. The purpose of these is not so much to gain new information as to survey existing data, discover unfilled gaps in information, and suggest practicable research problems.

The problem set by Collins and Tibbits is to explore the fields of health measurement, measure changes in the health environment, and assess changes in organization and methods of preventing and treating illness. Recognizing the difficulties in establishing

standards of physical fitness in terms by which the health status of populations may be measured, the authors suggest that changes in health may best be determined indirectly through variations in mortality rates, sickness rates, and prevalence of physical defects including malnutrition and underweight. The principal indexes of health measurement suggested are: (1) infant neonatal and maternal mortality and stillbirths; (2) general mortality rates; (3) morbidity or sickness rates; (4) accidents; (5) nutrition, height and weight. The principal sources of data relative to the above indexes are indicated and methods of using them to evaluate changes in public health during the depression are suggested.

The second part of the study is concerned with changes which may have taken place in the public health as a result of alterations in the economic status of large groups in the population. The writers point out that changes in income and economic status are significant only in so far as they affect the fundamental factors necessary to health, such as food, shelter, clothing, and other conditions necessary to health maintenance. Since such changes probably take place as the proportion of the population living at or below subsistence levels changes, research is suggested along 4 lines: (1) minimum subsistence incomes; (2) consumption levels; (3) occupational environment or working conditions; (4) changes in the social environment. The third line of investigation suggested is a study of recent changes in community technics for providing facilities for the prevention and treatment of illness.

The emphasis in this as well as other volumes in the series is placed on research. The authors have done an excellent job in making available the results of a great many important investigations, locating the primary sources of data and suggesting research

problems which seem likely to throw light on what has happened to the public health during the depression. Researchers will find the study an invaluable guide. Its greatest value lies in orienting the student in the field and showing him the directions in which future research seems to hold the greatest promise.

In the second memorandum Professor Sellin outlines a research program for the study of the possible effects of the depression on crime trends. Since the law defines the nature of crime, the author believes that any study of trends must begin with an examination of the changes in the law itself. We need to know what conduct, previously legal, is now criminal, as well as what illegal conduct has been dropped from the law. We need to know what changes have taken place in the severity of penalties imposed by the law before we can estimate the changes which may have occurred in the amount of crime during the depression. In chapters two and three, studies of the relation between economic fluctuations and crime, in Europe as well as in the United States, are reviewed. The results of these studies, most of them made before the depression, are rather disappointing. They indicate the almost insuperable difficulties of attempting statistical measurements of such complex relationships as may exist between crime and economic change. Some of the basic difficulties in such statistical correlations are set forth in the next chapter on the "index question." The final problem suggested is an analysis of administrative agencies; the police, the courts, and the penal and correctional institutions and agencies. In the last chapter Professor Sellin suggests some next necessary steps in research to test the validity of a series of common theories concerning the effects of economic fluctuations on crime. The value of this memorandum lies in show-

ing how little we know scientifically concerning matters about which opinions are so commonly and so dogmatically held. C. T. PIHLBLAD

Federal and State Control of Milk Prices—By *James A. Tobey, Dr.P.H.* Chicago: *International Association of Milk Dealers*, 1937 42 pp. Price, \$2.00.

This concise volume supplements effectively *The Legal Aspects of Milk Control* by the same author. Members of the dairy industry as well as milk control officers will find useful this discussion of government regulation of milk prices and the production and distribution of milk. The volume reviews the Constitutional status of laws fixing prices and regulating the production and distribution of milk as shown by court decisions. IRA V. HISCOCK

An Introduction to the Social Studies—By *Joseph K. Hart, Ph.D.* New York: *Macmillan*, 1937. 203 pp. Price, \$2.00.

While this book is not concerned primarily with the public health, it is a book that every public health worker should read. The author modestly calls it an elementary text book for professional and preparatory groups. While this may define its roots, the ramifications of its branches cover most of the problems of a modern democratic order and give us an excellent picture of contemporary social problems.

The chapters on "A Healthy Social Order," and "Our Social Profession," should prove especially helpful to those who are trying to clarify their social vision. The book is written in an easy style and its chapter divisions are arranged to carry the reader along from one interest to another. Each chapter is followed with suggestions for further study, and a selected book list appears at the end of the volume.

RICHARD A. BOLT

Russian Medicine (Clio Medica)
—By E. Horsley Gantt. New York:
Hoeber, 1937. 214 pp. Price, \$2.50.

The little volume is more than a history of Russian medicine. It is also a thumb-nail sketch of the history of Russia as well. The reviewer read this book with great interest. It contains a great deal of solid information regarding Russia and recounts enough dramatic incidents to save it from being too heavy.

All references to Russian medicine inevitably contain a eulogy of Pavlov just as similar books on medicine in Spain emphasize the importance of Ramon y Cajal. This is, of course, as it should be, but it also emphasizes the sterility of medicine in these two countries.

The last chapter in the book on

Soviet Medicine should be of particular interest to many American physicians who fear that attempts are being made to Sovietize American medicine. The impression that one gains from reading this book is that the general health of the Russian people has improved under the later years of the Soviet regime as well as the average standard of medical service. One also gains the impression which coincides with that of many medical travelers to the Soviet Union that in the scientific and clinical work the workers impress the visitors more with their enthusiasm than with their critical judgment.

This book of Dr. Gantt's can be heartily recommended as both interesting and informative. It belongs to the series, "Clio Medica," edited by E. B. Krumbharr, M.D. RALPH H. MAJOR

BOOKS RECEIVED

HOW TO USE PICTORIAL STATISTICS. By Rudolph Modley. New York: Harper, 1937. 170 pp. Price, \$3.00.

THE MIND OF MAN: THE STORY OF MAN'S CONQUEST OF MENTAL ILLNESS. By Walter Bromberg. New York: Harper, 1937. 323 pp. Price, \$3.50.

MODERN WAYS WITH BABIES. By Elizabeth B. Hurlock. Philadelphia: Lippincott, 1937. 347 pp. Price, \$2.50.

EMOTIONAL HYGIENE: THE ART OF UNDERSTANDING. By Camilla M. Anderson. Philadelphia: Lippincott, 1937. 242 pp. Price, \$2.00.

THE NURSERY YEARS. By Susan Isaacs. New York: Vanguard Press, 1936. 138 pp. Price, \$1.50.

MUIR'S BACTERIOLOGICAL ATLAS. Second Edition. Atlas Enlarged and Text Rewritten by

C. E. van Rooyen. Baltimore: Wood, 1937. 90 pp. Price, \$5.25.

CHILD LABOR AND THE NATION'S HEALTH. By S. Adolphus Knopf. Boston: Christopher Publishing House, 1937. 32 pp. Price, \$.50.

MAN, BREAD AND DESTINY. By C. C. Furnas. New York: Reynal and Hitchcock, 1937. 364 pp. Price, \$3.00.

A PRIMER FOR DIABETIC PATIENTS. Sixth Edition Revised. By Russell M. Wilder. Philadelphia: Saunders, 1937. 191 pp. Price, \$1.75.

SOME FUNDAMENTAL ASPECTS OF THE CANCER PROBLEM. Edited by Henry Baldwin Ward. New York: The Science Press, 1937. 248 pp. Price, Cloth \$2.50, Paper, \$2.00.

PERSONNEL POLICIES IN PUBLIC HEALTH NURSING. By Marian G. Randall. New York: Macmillan, 1937. 170 pp. Price, \$2.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

How to Get Parents' Consents— How one health officer put some quite ordinary health educational measures to work and the good results he got. The moral is that we are not so much in need of elaborate and novel educational technics as we are of using the measures already tried out in the hard school of experience.

CHOPE, H. D. The Rôle of Health Education in a Tuberculosis Testing Campaign. *J. School Health*. 7, 9:211 (Nov.), 1937.

Tuberculosis Goes to College— Sampling the incoming freshmen at a number of important universities it was found that 6 per 1,000 had adult type tuberculosis and that 30 per cent were tuberculin positive. On this basis there must be 6,000 college students with tuberculosis, and a third of a million with some form of tuberculous infection. Among high school students there must be 50,000 cases of tuberculosis. The total cost of tuberculosis in these two groups alone exceeds a hundred million dollars.

FERGUSON, L. H. A Five Year Review of Tuberculosis in College Students. *Am. Rev. Tuberc.* 36, 4:478 (Oct.), 1937.

May This Good Work Go On— This committee points out that some commercial interests are stressing excessively low summer temperatures, permitting too great air velocities, and failing to employ dehumidifying devices. Comfort and health alike are jeopardized. You're telling us, committee!

HAYHURST, E. R., *et al.* Equipment for Air Conditioning. *A.J.P.H.* 109, 22:1802 (Nov. 27), 1937.

As Guards Go Down— Of a thousand plus students entering a middle-west university more than a quarter had not been vaccinated; a third had only slight immunity; 61 per cent were in some degree susceptible to smallpox. Not a wholesome picture.

HUSBAND, M. W., and LOY, D. T. Immunity to Smallpox. *J.A.M.A.* 109, 22:1797 (Nov. 27), 1937.

Continuing Southern Sanitary Problem— Sampling the rural population in North Carolina, a hookworm infestation incidence of 12 per cent among the whites was revealed. In the same counties the Rockefeller Sanitary Commission found a 36 per cent incidence some twenty-five years ago. It is evident that much work remains to be done before the last worm is unhooked.

KELLER, A. E., *et al.* The Present Status of Hookworm Infestation in North Carolina. *Am. J. Hyg.* 26, 3:437 (Nov.), 1937.

While School Children Are Weighed and Measured— Though commending the arm-girth, chest-depth, hip-width measures, the author points out that they, like other methods of judging nutritional status, have their limitations, but come closest to measuring the true health of the child.

KLEINSCHMIDT, E. E. What Standards Should Be Used in Determining the Nutritional Status of School Children? *J. School Health*. 7, 9:216 (Nov.), 1937.

Educating Health Workers— Three projects for continuing staff education are under way in Kentucky. The first group is the state department personnel, the second, the county health

workers, and the third is for allied groups, physicians, nurses, educators, social workers, etc. Each project has a separate committee carrying out independent plans.

McCORMACK, A. T., and HARRIS, R. F. Kentucky's Plan for Public Health Education. *Pub. Health Rep.* 52, 44:1530 (Oct. 29), 1937.

Last Word in Diphtheria Prophylaxis—Although we have not yet sufficient evidence to determine the one best way to immunize against diphtheria, the man who should know most about the subject suggests that two doses, one of alum precipitated and one of fluid toxoid will give the best results.

PARK, W. H. Duration of Immunity Against Diphtheria Achieved by Various Methods. *J.A.M.A.* 109, 21:1687 (Nov. 20), 1937.

Leadership for Modern Health Objectives—Although the Surgeon General was speaking to nurses, his discussion applies equally to other public health workers and should be required reading for all. He said that until research produces new knowledge, it is by striving against syphilis, tuberculosis, cancer, pneumonia, infant and maternal mortality that the greatest savings in mortality can be made. Far more use of public health nursing should be made than has been made in the past.

PARRAN, T. Public Health Nursing Marching On. *Pub. Health Nurs.* 29, 11:617 (Nov.), 1937.

About V. D.—How venereal diseases are combated on a grand scale in New York City is told by the health officer. The plan includes vastly increased diagnostic and treatment services, epidemiologic investigations, educational activities, and reporting.

RICE, J. L. Combating Syphilis and Gonorrhea. *New York State J. Med.* 37, 21:1822 (Nov.), 1937.

School Health Education By Whom?—Suppose a group of orthopedists decided that the children under their care needed some general educational services, so they call in an educator to the hospital at the beginning of the year to tell them what to do about their educational problems. Would the school man be flattered? Would he feel that the problem could be solved so? It is high time, the author says, to stop talk and to begin doing in the matter of preventive medicine in the school program.

SMILEY, D. F. The Preventive Medical Versus the Physical Training Approach to School Health Problems. *J. School Health.* 7, 9:214 (Nov.), 1937.

Heaven Lies About Us in Our Infancy—Providing a time table for physicians who may want to immunize the helpless infants, among the families in their practice, against smallpox, diphtheria, scarlet fever, pertussis, and typhoid fever, the authors consider the addition of a tuberculin test to the lengthening list of punctures.

STEWART, C. A., and PLATOU, E. S. Communicable Disease Control in Private Practice. *J.A.M.A.* 109, 19:1520 (Nov. 6), 1937.

Tuberculosis Contacts—South or north, city or country, household exposure to open tuberculosis produces the disease in about the same proportion of contacts. In this Tennessee study, slightly more than 1 per cent per year in the 10 year period following exposure were recorded—about the same as noted in Philadelphia and North Carolina.

STEWART, H. C., *et al.* Tuberculosis Studies in Tennessee. *Am. J. Hyg.* 26, 3:527 (Nov.), 1937.

ASSOCIATION NEWS

EXECUTIVE BOARD MEETING

THE following is a brief resumé of the discussions and actions of the Executive Board at its meeting on December 17.

There were present:

John A. Ferrell, M.D., *Chairman*

J. N. Baker, M.D.

Louis I. Dublin, Ph.D.

John P. Koehler, M.D.

Arthur T. McCormack, M.D.

Thomas Parran, M.D.

John L. Rice, M.D.

Huntington Williams, M.D.

Abel Wolman, Dr.Eng.

Reginald M. Atwater, M.D., *Executive Secretary*

The appointment of Gregoire F. Amyot, M.D., D.P.H., as Administrative Associate in the study of State Health Facilities, effective January 1, 1938, was confirmed. Dr. Amyot was formerly Assistant Health Officer, Provincial Board of Health, Vancouver, B. C., Canada.

The 1939 Annual Meeting city will be selected from the Central or the Northeast area. The cities in the Central area are Louisville, Chattanooga, Columbus, Cincinnati, and Pittsburgh. Those in the Northeast area are Baltimore, Washington, Newark, Philadelphia, New York City, and Atlantic City.

New appointments of Fellows to the Committee on Research and Standards were confirmed as follows:

Margaret G. Arnstein, R.N. (1940)

Richard A. Bolt, M.D. (1940) reappointment

Walter S. Frisbie (1938)

A. Parker Hitchens, M.D. (1940)

John F. Norton, Ph.D. (1940) reappointment

Clair E. Turner, Dr.P.H. (1940) reappointment

As provided in the By-laws, the following appointments were made by the

Sections indicated to the Committee on Eligibility and were confirmed. These terms expire in 1939.

Mary V. Dempsey, Vital Statistics Section
Emery R. Hayhurst, M.D., Industrial Hygiene Section

George D. Lummis, M.D., Health Officers Section

Agnes J. Martin, R.N., Public Health Nursing Section

Charles F. Wilinsky, M.D., Child Hygiene Section

The Executive Board considered and approved a long list of appointments to Association and Section Committees to be published in full in the 1937-1938 *Year Book*.

C. C. Young, Dr.P.H., Director of Laboratories, State Department of Health, Lansing, Mich., was declared elected to fill a vacancy on the Governing Council, with term expiring in 1938.

Approval was given to the request of the Health Officers Section for conducting an Institute for Health Officers in connection with the Kansas City Annual Meeting.

A progress report was received from the Exploratory Committee of the Executive Board charged with a study of the Public Health Aspects of Medical Care.

The Executive Secretary was empowered to appoint a committee to serve with the Section Secretaries as a Program Committee.

A plan governing the publication of the *American Journal of Public Health* was approved and an Editorial Board of five Fellows was named. These selections will be announced when acceptances have been received. Dr. Mazýck P. Ravenel was designated Editor, and the Executive Secretary was appointed Managing Editor.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Asa Barnes, M.D., Kennett, Mo., District Health Officer, State Board of Health
 John W. E. H. Beck, M.D., State Health Dept., Austin, Tex., Director, Local Health Services
 William R. Cameron, M.D., C.P.H., King St., Hagerstown, Md., Washington County Health Officer
 Bernard Greenberg, M.D., 1934 Bergen St., Brooklyn, N. Y., Borough Chief, Bureau of Preventable Diseases, New York City Department of Health
 Robert M. Matts, M.D., Box 207, Yuma, Ariz., Director, Yuma County Health Service
 Henry G. Steinmetz, M.D., 104 S. Indiana Ave., Bloomington, Ind., Director, District Health Department, State Board of Health
 Thomas L. Waggoner, M.D., 203 S. Park, San Angelo, Tex., Director, District Health Dept., State Department of Health

Laboratory Section

Raul Ferramola, Corrientes 4317, Buenos Aires, Argentina, S. A., Bacteriologist, Obras Sanitarias de la Nacion
 Archibald M. Fitz-Randolph, 915 Fifth Ave., Asbury Park, N. J., Bacteriologist, Monmouth County Local Health Unit #1
 Agnes C. Hamann, 333 E. 68 St., New York, N. Y., Laboratory Assistant, Dept. of Health
 Dora Snyder, City Laboratory, Lubbock, Tex., City Bacteriologist
 Eugenio Suarez, M.D., Instituto Bacteriologico, Santiago, Chile, S. A., Director

Vital Statistics Section

John P. Mills, 393-7th Ave., New York, N. Y., Assistant Superintendent, Equitable Life Assurance Society
 Edward S. Weiss, 329 Catherine St., Ann Arbor, Mich., Student

Public Health Engineering Section

Clayton H. Billings, Floydada, Tex., District Sanitarian, State Dept. of Health
 Frank J. Brands, 388 St. Johns Place, Brooklyn, N. Y., Veterinarian, Dept. of Health
 Leigh I. Holdredge, 27 Ford Ave., Oneonta, N. Y., District Sanitary Engineer, State Dept. of Health
 Robert F. Killeen, 702 E. Ellsworth St., Mid-

land, Mich., Sanitarian, Midland County Health Dept.

Leonard A. Lankford, County Health Dept., Dallas, Tex., Sanitarian
 Albert W. Petty, 201 Haughton St., Williamston, N. C., District Sanitarian, State Board of Health
 Vernon G. Wait, 465 W. Huron St., Pontiac, Mich., City Sanitarian

Industrial Hygiene Section

Nehemiah Janko, M.D., 25 Marble Hill Ave., New York, N. Y., Practising Physician

Food and Nutrition Section

Edward A. Crawford, 415 N. Caroline St., Herkimer, N. Y., Inspector of Foods, New York City Dept. of Health
 Harry D. Kruse, M.D., Sc.D., 40 Wall St., New York, N. Y., Nutrition Survey, Milbank Memorial Fund
 Flavius A. Newkerk, 52 Watkins Ave., Middletown, N. Y., Inspector of Foods and Drugs, New York City Dept. of Health
 Meyer Schubert, 601 W. 162 St., New York, N. Y., Inspector of Foods, Dept. of Health

Child Hygiene Section

Richard F. Boyd, M.D., State Board of Health, Topeka, Kans., Assistant Director, Division of Child Hygiene
 Ernest Buffone, M.D., 1705-78 St., Brooklyn, N. Y., Medical Inspector, School Hygiene, Dept. of Health
 Van C. Tipton, M.D., 812 Avondale Rd., Austin, Tex., Field Director, Maternal and Child Health, State Dept. of Health

Public Health Education Section

Weyman C. Huckabee, 323 Zakoba Machi, Hiroshima, Japan, Director, Fukushima Cho Public Health Center (At present—Student at Yale University)
 Milton I. Levine, M.D., 41 W. 96 St., New York, N. Y., Director of Study on Tuberculosis Immunization, Bureau of Laboratories, Dept. of Health
 Vonda M. Roach, 118 W. Shaw, Tyler, Tex., Nurse, Tyler-Smith County Health Unit
 Mildred Schpeiser, 655 Barbey St., Brooklyn, N. Y., Health Education Worker, Queensboro Tuberculosis and Health Association
 Verna L. Stanford, 118 W. Shaw, Tyler, Tex., Nurse, Tyler-Smith County Health Unit

Public Health Nursing Section

- Bertha L. Allwardt, 333 E. 30 St., New York, N. Y., Nursing Field Representative for New York State, American Red Cross
- Gladys L. Crain, R.N., 81 Strathmore Rd., Brighton, Mass., Nurse Epidemiologist, State Dept. of Public Health
- E. Hazel Golly, 711 N. Jay St., Rome, N. Y., State Staff Nurse, State Dept. of Health
- Anna E. O'Brien, R.N., 1310 State St., Schenectady, N. Y., General Director, Public Health Nursing Association of Schenectady County
- Lucille Perozzi, R.N., 816 Oregon Bldg., Portland, Ore., Educational Director, Division of Public Health Nursing, State Board of Health
- Anna L. Pick, 42 S. Grand St., Cobleskill, N. Y., County Nurse
- Frances A. Valliant, R.N., 1421 Madison Ave., New York, N. Y., Student at present
- Mary J. Wallace, 1917 Washtenaw, Ann Arbor, Mich., County Nurse, Michigan Dept. of Health
- AuVerne Ware, R.N., 726 N. Beacon St., Dallas, Tex., County Public Health Nurse

Margaret M. Whalen, R.N., 65 Broad St., Rochester, N. Y., District State Supervising Nurse, State Dept. of Health

Epidemiology Section

- Harry S. Lichtman, M.D., 8735 Bay Parkway, Brooklyn, N. Y., District Diagnostician, Dept. of Health
- Harold M. Williams, M.D., City Hall Annex, Fort Worth, Tex., Epidemiologist, Dept. of Health

Unaffiliated

- Alfred Koerner, M.D., 53 E. 96 St., New York, N. Y., Inspector, Dept. of Health
- John Neilson, Jr., M.D., 122 E. 42 St., New York, N. Y., General Practitioner
- Paul T. Salchow, M.D., 956 Pingree Ave., Detroit, Mich., Student at present
- Wells O. Stephens, Jr., D.D.S., Gregg County Health Unit, Longview, Tex., Director of Dental Service
- Allan A. Twichell, 310 Cedar St., New Haven, Conn., Technical Secretary, Committee on Hygiene of Housing, American Public Health Association

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS AVAILABLE

The U. S. Civil Service Commission announces an unassembled examination for the positions of Principal Consultant in Child Welfare Services at \$5,600 a year, and Principal Consultant in Medical Social Work for

Children at \$5,600 a year. Applications must be on file by January 10. Circular No. 3 may be obtained from the Civil Service Commission in Washington or any first class post office.

POSITIONS WANTED

HEALTH OFFICERS

Experienced physician, administrator, epidemiologist, and teacher, now employed, with C.P.H. from Johns Hopkins and 14 years' public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, M.D., Johns Hopkins; public health course at Michigan; experienced in school and city health work, will consider an administrative post in eastern United States. A354

Physician, M.D., Western Reserve; short course for health officers, Johns Hopkins; with county and state experience, wishes administrative or epidemiological position; north or west preferred. A349

Physician, M.D., Yale, completing M.P.H. at Columbia; good clinical background; will consider appointment in child health, epidemiology or public health administration. A350

Physician, M.D., Northwestern University; Dr.P.H., Yale; will consider appointment in general administration, infant welfare or epidemiology. A300

Experienced Health Officer who has completed Vanderbilt short course, 1936, will consider appointment. West preferred. A320

Physician, M.D., University of Maryland; C.P.H., Johns Hopkins; broad experience in county public health administration, will consider opening of better class. A346

CHILD HYGIENE

Woman physician, M.D., Rush Medical; Wishes administrative or clinical position in maternal and child health. C347

Woman physician, M.D., Yale; Dr.P.H., Yale; experienced in pediatrics and administration of state bureau, will consider attractive opening. C348

STATISTICIAN

Young man with 8 years' experience in public health statistics in well known national organization, and degree in Business Administration, now employed, will consider statistical position or combination with office administration. A310

MISCELLANEOUS

Dentist, graduate of Temple University, with excellent post-graduate experience, desires position in administrative aspects of dental hygiene. M352

Woman with excellent preparation and wide experience in health education field; organization, administration, supervision and program-making in city, rural and state work. Now employed but would consider good opportunity. \$3,500 minimum. M316

Bacteriologist with training at C.C.N.Y., N.Y.U. and Cornell Medical College, wishes laboratory position in bacteriology; East or Southwest. M351

Experienced teacher, B.S., Massachusetts Institute of Technology; graduate courses Harvard School of Public Health, wishes teaching position or will consider statistical or health education opportunity. M353

NEWS FROM THE FIELD

UNITED STATES CONFERENCE OF MAYORS

THE United States Conference of Mayors made public the report of its National Health Officers Qualifying Board created early in 1937 under a resolution enacted at the 1936 Annual Conference. This board, consisting of leading public health authorities of the United States, was established for the specific purpose of formulating the professional qualifications which commissioners of public health in the larger cities of the nation should have. The job was undertaken as the first step in the long-term program of the Conference of Mayors in improving the professional qualifications for those who hold important municipal offices throughout the country.

The membership of the National Health Officers Qualifying Board of the Conference of Mayors is as follows:

Joseph W. Mountin, M.D.,* *Chairman*
 Allen W. Freeman, M.D.*
 John L. Rice, M.D.*
 Wilson G. Smilie, M.D.*
 Huntington Williams, M.D.*
 Carl V. Reynolds, M.D.†
 Edward S. Godfrey, Jr., M.D.*

The committee's report, which has been awaited by the medical and public health professions, provides for the following technical qualifications for chief municipal health officers:

QUALIFICATIONS FOR CITY HEALTH OFFICERS

Grade I

(Applicable, in general, to cities of 500,000 population and over.)

The minimum qualifications for health officers in this class shall consist of:

* Fellow A.P.H.A.

† Member A.P.H.A.

Graduation in medicine from a Grade A Medical School and not less than 6 years' full-time experience in public health work, 3 years of which must be in a responsible administrative position; 2 of the 3 years of general experience may be substituted by a course in public health of not less than 1 scholastic year in residence at a recognized institution of learning.

Grade II

(Applicable, in general, to cities of from 100,000 to 500,000 population.)

The minimum qualifications for health officers in this class shall consist of:

Graduation in medicine from a Grade A Medical School and not less than 4 years' full-time experience in public health work, 1 year of which must be in a responsible administrative position; 2 of the 3 years of general public health experience may be substituted by a course in public health of not less than 1 scholastic year in residence at a recognized institution of learning.

Grade III

(Applicable, in general, to cities under 100,000 population.)

The minimum qualifications for health officers in this class shall consist of:

Graduation in medicine from a Grade A Medical School and not less than 2 years of full-time experience in public health work, or, 1 year of such full-time experience and the completion of a course in public health of not less than 1 year in residence at a recognized institution of learning.

The board will act, at the request of any city, to determine whether candidates for the office of health commissioner, possess the qualifications adopted by the board. If so, the board will certify to the city this fact.

It is noteworthy that the qualifications for public health officers for the first time impose definite and specific medical and *public health* training and experience.

President LaGuardia, in commenting on the report, said:

"We are now beginning to make progress. If every city will adopt the recommendations now made by our special public health committee, we can avoid having the so-called "pill doctor" or the family physician appointed to the important office of Commissioner of Health. Public health administration involves factors requiring personnel with *public health* experience and not only just general medical training. Consequently, if we can establish accepted standards or qualifications which all persons must have who seek the highest public health position in a city, we are insuring a real merit system.

"We have taken public health first because we have had the coöperation of the public health profession itself. We shall next establish committees in other fields—finance, fire, police, etc., and endeavor to develop qualifications for the major posts in the municipal service in these fields. Reformers have been talking for fifty years about the merit system. But it has remained for the mayors, acting collectively, to make the first real contribution in professionalizing the public service, in so far as the highest municipal offices are concerned."

The following resolution was passed:

QUALIFICATIONS FOR MUNICIPAL HEALTH OFFICERS

WHEREAS, the United States Conference of Mayors has now received the report of its committee of seven outstanding public health authorities, and

WHEREAS, this report sets up standard professional qualifications for Commissioners of Health in the larger cities of the country, therefore be it

RESOLVED, that the United States Conference of Mayors recommend to the cities of the country that the suggested standard qualifications for health officers be followed by all cities when appointments to the office of Health Commissioner are made in the future.

CONFERENCE ON MATERNAL AND CHILD WELFARE

A CONFERENCE on the theme of "Better Care for Mothers and Babies" has been called by Katharine

F. Lenroot,[†] Chief of the Children's Bureau, U. S. Department of Labor, to be held in Washington, D. C., January 17-18.

The Planning Committee appointed for the conference includes representatives of many national agencies, among them the American Public Health Association.

Miss Lenroot states that the problem of maternal care and care of the newborn continues to be a matter of grave concern to the people of this country. No matter what method of statistical procedure is used to assign cause to maternal deaths, the United States retains an exceedingly high maternal mortality rate as compared with other countries. In 1935 the number of maternal deaths due directly to pregnancy and childbirth was 12,544. Additional deaths of pregnant women due to other primary causes raised the total number to 14,296. The number of stillbirths in 1935 was 77,119, and the number of babies dying in the first month of life as the result of causes arising during pregnancy or at time of delivery was 56,262. This means that the total number of deaths of mothers, stillbirths, and deaths of babies in the first month of life from causes associated with maternal conditions was 147,677 for the single year of 1935.

The forthcoming conference will canvass in a broad way the resources now available and the work now being done in behalf of mothers and babies throughout the country through the coöperative efforts and under the leadership of the medical profession, public health officials, nursing organizations, professional and lay groups, and interested individuals. It should furnish an opportunity for fruitful discussion and sound planning.

* Fellow A.P.H.A.

† Member A.P.H.A.

PNEUMONIA FILM

A NEW film on pneumonia, "A New Day," has been made in Hollywood by a professional cast. It had its premier public showing at the Radio City Music Hall in New York, December 16.

The new picture was sponsored by the U. S. Public Health Service and produced by the Metropolitan Life Insurance Company. It is introduced by a brief talk by New York City Health Commissioner John L. Rice.*

PNEUMONIA ADVISORY COMMITTEE

TO plan a program for pneumonia control on a national scale, Thomas Parran, M.D.,* Surgeon General of the U. S. Public Health Service, recently appointed an Advisory Committee, which held its first meeting November 12, in Washington, D. C.

Members of the Committee are:

Donald B. Armstrong, M.D.,* Metropolitan Life Insurance Company, New York, N. Y.

David P. Barr, M.D., Washington University School of Medicine, St. Louis, Mo.

Russell L. Cecil, M.D., Cornell University Medical School, New York, N. Y.

Lloyd D. Felton, M.D.,† Johns Hopkins University School of Medicine, Baltimore, Md.

Alfred Friedlander, M.D.,† University of Cincinnati College of Medicine, Cincinnati, O.

Roderick Hefron, M.D.,† Commonwealth Fund, New York, N. Y.

Ernest E. Irons, M.D., Rush Medical College, Chicago, Ill.

Roger I. Lee, M.D., Consultant in Internal Medicine, Boston, Mass.

George H. Ramsey, M.D.,* New York State Department of Health, Albany, N. Y.

Y.M.C.A. SYPHILIS CAMPAIGN

THE National Council of the Young Men's Christian Association has issued a bulletin urging local units to coöperate with physicians and health officials in the drive against syphilis.

The local units are urged to take specific steps for investigation, education and arrangements with physicians for Wassermann tests.

NEW MEXICO PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

THE following new officers were elected by the New Mexico Public Health Association at its annual meeting held in November:

President—William W. Johnston, M.D.,* Las Vegas, N. M.

Vice-President—Helen B. Fenton, R.N.

Secretary-Treasurer—James R. Scott, M.D., Ph.D.,* Albuquerque, N. M.

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

THE Pennsylvania Public Health Association has elected new officers as follows:

Honorary President — Edith MacBride-Dexter, M.D.,† Harrisburg, Pa.

President—John M. J. Raunick, M.D.,* Harrisburg, Pa.

First Vice-President—Harold H. Keller,† Philadelphia, Pa.

Second Vice-President—H. W. Banks, M.D., Prospect Park, Pa.

Secretary-Treasurer—Arthur M. Dewees,† Philadelphia, Pa.

Executive Secretary—Thomas Shriver.

Representative to the Governing Council, A.P.H.A.—Henry Field Smyth, M.D., Dr.P.H.,* Philadelphia, Pa.

FLORIDA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

THE Florida Public Health Association elected the following new officers for 1938 at its recent annual meeting:

President—N. A. Upchurch, M.D.,* Jacksonville, Fla.

First Vice-President—L. J. Graves, M.D., Tallahassee, Fla.

Second Vice-President—Lalla M. Goggans, R.N.,† Jacksonville, Fla.

Secretary-Treasurer—Edward M. L'Engle, M.D.,† Jacksonville, Fla.

Representative on A.P.H.A. Governing Council—William H. Pickett, M.D.,* Pensacola, Fla.

* Fellow A.P.H.A.

† Member A.P.H.A.

SOUTHERN BRANCH A.P.H.A.

ELECTS OFFICERS

AT its Sixth Annual Meeting, the Southern Branch of the American Public Health Association elected the following new officers:

President—James A. Hayne, M.D.,* Columbia, S. C.

First Vice-President—H. A. Kroeze, B.C.E.,† Jackson, Miss.

Second Vice-President—Frances F. Hagar, R.N.,* Nashville, Tenn.

Third Vice-President—Martin R. Beyer, M.D.,† Oklahoma City, Okla.

Secretary-Treasurer—G. Foard McGinnes, M.D.,* Richmond, Va.

NEW JERSEY HEALTH ASSOCIATION

AT the Sixty-third Annual Meeting of the New Jersey Health and Sanitary Association, held at Princeton, N. J., December 10–11, new officers were elected as follows:

President—William H. MacDonald, M.S.,† Trenton, N. J.

First Vice-President—Joseph R. Morrow, M.D., Ridgewood, N. J.

Second Vice-President—Leverett D. Bristol, M.D., Dr.P.H.,* New York, N. Y.

Third Vice-President—L. Van D. Chandler,* Hackensack, N. J.

Secretary—Edward Guion, M.D.,* Northfield, N. J.

Treasurer—Budd H. Obert,* Asbury Park, N. J.

John Hall, B.S.,* of Freehold, N. J., continues as Executive Secretary.

MICHIGAN PUBLIC HEALTH ASSOCIATION

ELECTS OFFICERS

AT its recent annual meeting, new officers of the Michigan Public Health Association were elected as follows:

President—Carleton Dean, M.D., C.P.H.,* Charlevoix, Mich.

Vice-President—John L. Lavan, M.D.,* Grand Rapids, Mich.

Secretary-Treasurer—Marjorie Delavan,* Lansing, Mich.

Representative on A.P.H.A. Governing Council—C. C. Slemons, M.D.,* Lansing, Mich.

PERSONALS

Central States

VICTOR E. LEVINE, M.D., Professor of Biological Chemistry and Nutrition and head of the Department, Creighton University School of Medicine, Omaha, Nebr., has established a medical and biological laboratory in the Arctic, at Point Barrow, Alaska, as a coöperative research project of the U. S. Public Health Service and Creighton University. Dr. Levine, with an Assistant, DELBERT F. FOORD, of the University of California, arrived in Alaska in August and expects to remain a year.

HUGH B. ROBINS, M.D.,† of Marshall, Mich., Associate Director of the Calhoun County Health Department, has been placed in charge of the Department, succeeding DR. MATTHEW R. KINDE,† who is now at the W. K. Kellogg Foundation, Battle Creek.

DR. CHARLES B. STEPHENS, of Iola, Kans., has been appointed Health Officer of Topeka.

Eastern States

HAZEL DUDLEY, R.N., has become Director of the Division of Public Health Nursing in the Connecticut State Department of Health, as of December 1. Miss Dudley previously was on the staff of the Henry Street Nursing Service, New York, N. Y.

CHARLES KURTZHALZ, of Chester, Pa., formerly Executive Secretary of the Delaware County Tuberculosis Association, has been appointed Executive Director of the Philadelphia Health Council and Tuberculosis Committee, to succeed the late HARVEY D. BROWN, Ph.D.†

ANNA L. TITTMAN, R.N.,† Vocational Secretary for Public Health Nursing, Joint Vocational Service, New York,

* Fellow A.P.H.A.

† Member A.P.H.A.

N. Y., has become the Executive Director of the Nurse Placement Service, 8 South Michigan Boulevard, Chicago, Ill., as of January 1.

Southern States

DR. GEORGE W. BAKER, of Walters, Okla., has been appointed Health Superintendent of Cotton County.

MONROE F. BROWN, M.D.,† of Fayetteville, Tenn., has been appointed to succeed FRANK L. ROBERTS, M.D.,† as Health Officer of Gibson County, with headquarters in Trenton.

DR. CHARLES M. COLE, of Chatom, Ala., has been appointed Health Officer of Washington County, succeeding DR. ISAAC C. SUMNER, of Chatom.

DR. WARREN A. COLTON, Clinical Director of the Veterans' Administration Facility, Kecoughtan, Va., has been named Chief Medical Officer, to succeed DR. EDWARD N. SCHILLINGER, who was recently transferred to Atlanta.

DR. EVA F. DODGE, of Winston-Salem, N. C., has been appointed to direct and organize antepartum clinics throughout Alabama for the Alabama State Department of Health. Headquarters will be in Montgomery, Ala.

DR. HARVEY C. HARDEGREE, recently on the staff at Excelsior Springs, Mo.,

has been appointed Clinical Director of the Veterans' Administration Facility, of Kecoughtan, Va., to succeed DR. WARREN A. COLTON.

DR. JESSIE M. HARRIS, of Wilberton, Okla., has been appointed Health Superintendent of Latimer County.

JAMES G. MCALPINE, PH.D.,† has resigned as Director of Laboratories, Alabama State Department of Health, Montgomery, Ala.

DR. SHADE D. NEELY, of Muskogee, Okla., has been appointed Health Superintendent of Muskogee County, to succeed DR. CHARLES E. WHITE, of Muskogee.

DR. GAPP M. RUSHING, of Durant, Okla., has been appointed Health Superintendent of Bryan County, to succeed DR. HENRY B. FUSTON, of Bohito.

DR. ISAAC C. SUMNER, of Chatom, has been appointed Assistant to the Health Officer of Mobile County, Ala.

DEATHS

FRANCIS B. GRINNELL, M.D., of the Department of Bacteriology and Immunology, Harvard University Medical School, Boston, Mass., Bacteriologist, died in England in November.

CHARLES E. KAUFMAN, M.D.,† Health Officer of West Haven, Conn., died December 3, at the age of 51.

CONFERENCES AND DATES

American Academy of Orthopaedic Surgeons. First West Coast Meeting. Hotel Biltmore, Los Angeles, Calif. January 16-20.

American Academy of Tuberculosis Physicians. San Francisco, Calif. June.

American Association of Medical Social Workers. Seattle, Wash. June 26-July 2.

American Association of Pathologists

and Bacteriologists. Atlantic City, N. J. May 3-4.

American Association of Psychiatric Social Workers. Seattle, Wash. June 26-July 2.

American Association of Schools of Social Work. New Orleans, La. January 28-29.

American Chemical Society. Dallas, Tex. April 18-21.

* Fellow A.P.H.A.

† Member A.P.H.A.

- American College of Physicians, Waldorf-Astoria Hotel, New York, N. Y. April 4-8.
- American Home Economics Association. Pittsburgh, Pa. June 28-July 1.
- American Institute of Nutrition. Baltimore, Md. Spring, 1938.
- American Medical Association. San Francisco, Calif., June 13-17.
- American Roentgen Ray Society. Atlantic City, N. J. September, 1938.
- American Society of Clinical Pathologists. San Francisco, Calif. June 9-11.
- American Society of Heating & Ventilating Engineers, 44th Annual Meeting. Hotel Biltmore, New York. January 24-28.
- American Veterinary Medical Association. New York, N. Y. July 5-9.
- American Water Works Association. Hotel Roosevelt, New Orleans, La. April 24-28.
- Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association. Palmer House, Chicago, Ill. February 14-15.
- Association for the Study of Allergy. San Francisco, Calif. June 13-14.
- Association for the Study of Internal Secretions. San Francisco, Calif. June 13-14.
- Association of Foods and Drug Officials of South Central States. Biloxi, Miss. May, 1938.
- Association of Western Hospitals. San Francisco, Calif. February 28-March 3.
- California Association of Health, Physical Education and Recreation. Pasadena, Calif. April 18-19.
- California Conference of Social Work. Pasadena, Calif. April 24-28.
- California Medical Association. Pasadena, Calif. May 9-12.
- Central Physical Education Association. Minneapolis, Minn. March 30-April 2.
- Child Labor Day—sponsored by National Labor Committee, 419 4th Avenue, New York. January 29.
- Congress of American Physicians and Surgeons. Atlantic City, N. J. May 2-6.
- Congress of Parent-Teachers Association. Battle Creek, Mich. April 20-22.
- Connecticut Milk Producers Association. Hartford, Conn. January 14.
- Dairy Products Association of the Northwest. St. Paul, Minn. April, 1938.
- Federation of State Medical Boards of the United States. Palmer House, Chicago, Ill. February 14-15.
- Fifth International Heating and Ventilating Exposition. Grand Central Palace, New York, N. Y. January 24-28.
- Georgia Public Health Association. Atlanta, Ga. May, 1938.
- Hawaii Territorial Medical Association. Honolulu, T. H. May, 1938.
- Hay Fever Association of America. Sault Ste. Marie, Mich. August 10-September 20.
- Illinois Dairy Products Association. Springfield, Ill. February 22-24.
- International Association for Dental Research. Minneapolis, Minn. May 12-13.
- International Association of Medical Museums—American and Canadian Section. Atlantic City, N. J. February 28-March 2.
- Iowa Public Health Association. Des Moines, Ia. May, 1938.
- Iowa Tuberculosis Association. Ottumwa, Ia. March, 1938.
- Manufacturing Chemists Association of the United States. Sky Top, Pa. June 2-3.
- Massachusetts Public Health Association. Boston, Mass. January 27.
- Maternal and Child Welfare Conference—"Better Care for Mothers and Babies." Sponsored by Children's

- Bureau, U. S. Department of Labor. January 17-18.
- Medical Library Association. Boston, Mass., June, 1938.
- National Association for Educational Publicity. Atlantic City, N. J. February 26-27.
- National Conference of Social Work. Seattle, Wash. June 26-July 2.
- National Conference on Weights and Measures. Washington, D. C. June, 1938.
- National Education Association. New York, N. Y. June 26-30.
- National Tuberculosis Association's Institute for the Training of Tuberculosis Workers—to be held under the auspices of New York University. New York Tuberculosis and Health Association, 386 Fourth Avenue, New York. January 31-February 12.
- National Warm Air Heating and Air Conditioning Association. New York, N. Y. January 24-26.
- New England Hospital Association. Boston, Mass. March 10-12.
- New York Diabetes Association (of the New York Tuberculosis and Health Association). Series of 6 weekly lectures for physicians on Diabetes Mellitus. Admission free. New York Academy of Medicine. January 20-February 24, incl.
- New York Heart Association—Annual Meeting. New York Academy of Medicine. January 18.
- Ohio Federation of Public Health Officials. Columbus, Ohio, April, 1938.
- Pan American Medical Association—Seventh Cruise Congress to Havana. (Pan American Medical Association, 745 Fifth Avenue, New York, N. Y.) January 15-31.
- Pennsylvania Public Health Association. Harrisburg, Pa. May, 1938.
- Public Health Association of New York City. New York. April, 1938.
- Second National Social Hygiene Day. Theme, "Stamp Out Syphilis—Foe of Youth." February 2.
- Social Work Publicity Council. Seattle, Wash. June 26-July 2.
- South Carolina Public Health Association. Myrtle Beach, S. C. May 23-25.
- Symposium on Higher Education in the South. Vanderbilt University, Nashville, Tenn. February 5.
- United Fresh Fruit and Vegetable Association. New Orleans, La. January 10-13.
- Western Branch, American Public Health Association. Hotel Multnomah, Portland, Ore. June 6-8.

FOREIGN

- World Conference on Leprosy. International Leprosy Association. Cairo, Egypt. March 21.
- American Water Works Association—Canadian Section. Windsor, Ont., Canada. March 23-25.
- International Congress on Rheumatism and Hydrology. Oxford, England. March 26-31.
- Industrial Accident Prevention Associations, Inc. Windsor, Ont., Canada. April 28-29.
- International Congress of Obstetrics and Gynecology. Amsterdam, The Netherlands. May 4-8.
- Scientific Congress of Doctors and Dentists—"ARPA." Prague. July 21-25, 1938.
- British Dental Association. Belfast. July 29-August 3.
- Fifth International Congress for Experimental Cytology. Zurich, Switzerland. August 7-12.
- International Meeting for Cell Research. Anatomical Institute, Zurich, Switzerland. August 7-13.
- Sixteenth International Physiological Congress. Zurich, Switzerland. August 14-18.
- British Association for the Advancement of Science. Cambridge, England. August 17-24.

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

February, 1938

Number 2

Health Education for the Millions*

LOUIS I. DUBLIN, PH.D., F.A.P.H.A., AND
HOMER N. CALVER, F.A.P.H.A.

Acting Chairman and Secretary, Committee on American Museum of Hygiene, American Public Health Association, New York, N. Y.

WE propose in this paper to discuss certain new procedures and technics in the field of health education. We have in mind the Museum of Hygiene as an instrument and will take this opportunity also to record the progress made in recent years in approaching this objective as a practical, functioning, educational institution.

We need not review here the immense literature on health education. We all know how continuous has been the effort to bring home to the great mass of people the knowledge necessary for avoiding disease and prolonging life. Somehow or other, we have not fully succeeded. We still pay a toll of at least a week of serious illness per capita each year. In addition, there is an unmeasurable but very serious loss of efficiency resulting not so much from clear-cut physical disability but from that hazy state in which a large part of our people find themselves wherein the body does not function well, where the joy of robust health is lacking.

Diseases we know perfectly well how to eliminate such as smallpox, diphtheria, typhoid fever, and malaria still cause serious inroads on health and life. In some areas, they continue to constitute a first class public health problem. Tuberculosis and pneumonia can be greatly reduced in their ravages. Altogether, at least 10 years can be added to the expectation of life of each newborn child if we could but get to the people the knowledge which the advances of science have given us and if this knowledge could in some way be converted into appropriate action.

Earlier, the difficulty was primarily that we did not know the causes of diseases and of premature breakdown nor the channels through which these causes operated. In more recent years with an enormous accumulation of information and with increased public and private health facilities, the problem has been one primarily of distribution, namely, bringing to the great mass of people the benefits of the discoveries in the laboratory and from the current practice of medicine and public health. The school, the newspaper and maga-

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

zine, and the spoken word, all have served and there is today a more widespread understanding of the principles of personal and social hygiene than ever before. Yet we have failed in bringing this knowledge and service to a very large part of our population. We have clearly underestimated the size of the job to be done. We have not reached the homes of the great mass of the common people. We must break the bottleneck in the flow of information from the laboratory and the clinics to the masses.

The fact is that the American people have not yet assimilated the spirit or content of the great achievements in medicine and in public health work. There are such sobering facts as the enormous growth of the Christian Science movement which clearly indicts our educational institutions for ineffective methods of teaching, and there are other evidences of crass ignorance, superstitions, and gullibility, as indicated by the size and profits of the business of quacks and nostrum venders. These facts, strikingly characteristic of our American life, show how far we still have to go in bringing home to the people the scientific basis upon which medicine and public health rest. We must find new ways.

We believe that the answer lies very largely in developing the mechanism of visual education. The eye is primarily the source of our increasing familiarity with the modern world. But we must not only see, we must handle. The educators know that the appeal must be to as many senses as we have in order to arouse interest, to hold attention, and for knowledge to become a part of us. We must develop a new mechanism on a huge scale for public health education. We believe that the answer lies in the methods of the modern museum.

Our Association took a very definite stand in this direction some years ago

when it appointed the Committee on the American Museum of Hygiene which was to investigate the subject and take the necessary steps which would lead to the establishment of Museums where the experiment could be tried to discover the methods by which the mass of knowledge in the field of medicine and public health could be more effectively brought home to the people. We have made some progress in this direction and our paper will be, in a sense, a summary of the present state of the operations of this committee.

For one thing, our committee has been continuously active canvassing and exploring this field and in assembling information. In like manner, we have encouraged other groups to do so in various parts of the country. Today the museum idea is on everyone's tongue.

This year grants were made to the Association for the purposes of the committee by the Carnegie Corporation of New York and the Josiah Macy, Jr. Fund. These made possible the employment of a staff which includes Dr. Benjamin C. Gruenberg who has prepared a well thought out document which will shortly be available for distribution. In this there has been assembled the accumulated information of the committee and the views of leading educators, physicians, and museum executives. A well equipped architect, Woodner-Silverman, has likewise been at work studying the physical problem of housing the exhibits and visualizing for us an ideal institution.

These studies will interest health workers everywhere. They suggest the importance, the means of approach and the possibilities for service for a Museum of Hygiene in their communities.

Running side by side with these efforts our committee has attempted to

pave the way to the establishment of an experimental institution, believing that to create one museum somewhere would be the best way to stimulate the creation of museums everywhere. Obviously in a time of financial depression, it has not been an easy matter to obtain that large sum of money necessary for the building of a museum and the furnishing of it with the expensive laboratories, materials, and personnel which a museum should clearly have. Instead we have utilized such opportunities as have come our way. Taking advantage of our experience with the Century of Progress we took prompt action when the proposal for a New York World's Fair was announced. We saw in this undertaking a unique occasion for an experiment in mass health education. It is conservatively expected that more than 20 million people will pass through the gates of this Fair in 1939. Why not attempt to bring home to these millions the fundamental health knowledge which has been accumulated during the years? Here was a chance to try out various technics. Fortunately, an administration of intelligence and vision at the World's Fair headquarters saw eye to eye with us on the possibilities of this undertaking and has made it possible for us to work with them. The Fair has created an Advisory Committee on Medicine and Public Health drawing on our Museum Committee for personnel and including over 100 representative medical and public health leaders. An Executive Committee of this larger group has been given authority to plan and erect a large and representative exhibit. The Fair Corporation will build a beautiful structure exclusively for medical and public health exhibits and has appropriated a sizable fund to aid the committee in arranging for some of the basic exhibit material.

One of the very first decisions made by the Executive Committee was that

the exhibit on medicine and public health must be planned to present a unified story, avoiding by all means the confusing result of selling space and allotting booths wherever they can be disposed of without reference to the presentation of any coördinated plan. It is not to be expected that a visitor can grasp the essentials of medicine and public health as a whole unless a very definite attempt is made to correlate the various parts of the exhibit. The New York World's Fair Committee on Medicine and Public Health has attempted to solve this problem by aiming for a completely scientific yet dramatic exhibit carefully planned in advance. Space as such will not be sold to commercial exhibitors. The committee has assumed the responsibility for the planning and financing of the entire exhibit. In this way it will from the very outset plan a completely rounded and coördinated presentation. This exhibit will, we believe, be the first attempt in America to produce a full size medical and public health exhibit at once scientifically sound and at the same time properly balanced as to its constituent parts.

The building itself is attractive and is extraordinarily well placed in relation to the chief attractions of the Fair. In all, there will be 80,000 square feet of space, making possible for exhibit purposes a net of a little over 37,000 square feet. We have divided our building into 4 main sections. There will be first a central Hall of Man, with a large focal exhibit on the human body in its normal functioning. Here will be demonstrated the anatomy and physiology of man, the dynamics of his various bodily functions, growth and reproduction, the glands of internal secretion and the organs of special sense. The problem of man's origin and his possible improvement will be considered. Exhibits in this hall will be similar to those which have been

developed by the German Hygiene Museum in Dresden, although many new models and features will be introduced.

Beyond the Hall of Man will be the Hall of Medical Science and the Hall of Public Health. Each of these halls has been divided into some 20 or more sections. The location of these sections between the two halls has been more or less arbitrary, although in general those which are principally medical have been assigned to the Hall of Medical Science, and those principally in the field of public health have been assigned to the Hall of Public Health. It is expected, however, that each subject will be treated in both its medical and public health aspects wherever it is located. In view of the limited space available, it will obviously not be possible to provide room for everything, and duplication must be avoided. The subjects selected for these sections are those which have seemed to the Executive Committee to be the most important. Such topics as the following have already been decided upon. In the Hall of Medicine, they are cancer, the filterable viruses, the common cold and influenza, pneumonia, tuberculosis, diabetes, the degenerative diseases of old age, heart disease, hospitals and the organized care of the sick, dentistry and oral hygiene, medical education, roentgenology, pharmacology and a number of allied topics. In the Hall of Public Health, sections will be devoted to health administration, the control of communicable diseases, tropical disease, children's diseases, maternal health, mental hygiene, industrial hygiene, safety, sanitary engineering, milk and food control, the conservation of sight, hearing and speech, superstitions, and finally a section devoted to a public health library and to an information service. The fourth main sub-division will be a theatre of hygiene, where a continuous program of lectures, demon-

strations, and motion pictures will be given.

Each of these sections, amounting in all to about 50, will be under the supervision of a special sub-committee whose duty it will be to formulate plans for the exhibit in the special field with which it is concerned. The committees will deal primarily with subject matter rather than with methods of presentation. Each committee is being asked to state what are the outstanding non-controversial facts in its field which it believes the public should be told. And we have been extremely fortunate with our group of committeemen and committee chairmen. They make up a literal "Who's Who" in medicine and public health. We can be assured that their labors will bring into sharp relief the most important and interesting information in their fields. To give us an interesting and instructive presentation of the facts, we have brought together a group of exhibit experts and technicians of outstanding training and experience. They will know how to tell our story so dramatically and persuasively as to justify the enormous labor which this project will entail by the scientific committees.

The problem of financing this exhibit has received our careful attention. It is the belief of the Executive Committee that there are a considerable number of large and ethical commercial and non-commercial organizations which have such an important stake in having the facts of medicine and public health presented dramatically to the public that they will be willing to sponsor these exhibits and to defray their cost. Already, from contacts made and from the reactions of a considerable number of such organizations, we have reason to believe that our plan of financing through sponsorship will be realized with assurance that our original plan of setting up an exhibit entirely scientific in character and completely

coördinated as to its parts will be carried out. There is then an important departure from tradition in that this exhibit is planned on the basis of a presentation of subject matter rather than on the exploitation of products or organizations.

Our experience with the medical exhibit at the Fair, we hope, will lay the foundation for the establishment of our much hoped for American Museum of Hygiene. We believe that our exhibit will be so excellent that there will be a spontaneous demand to keep the materials intact and to exhibit them in a permanent institution—the first American Museum of Hygiene. This, of course, is our ambition; only time will prove the extent to which we are justified in our faith.

We have already in the discussion of our plans for the World's Fair exhibit outlined pretty much what are the chief characteristics of this permanent Museum of Hygiene. Briefly to recapitulate, we have in mind for such a museum a dynamic approach to the problem how to teach the average man and woman what they should know about their own physical organization; how the progress in medicine and public health affects them personally; and how they can make for themselves a better and more healthful life. Certainly this museum is not conceived in the old sense as a mausoleum for old bric-a-brac. It is rather a modern laboratory of health education. Its methods include the use of three dimensional materials, moving objects, and all other modern technics. It will experiment with new methods and new materials. It will attempt continuously to evaluate its own work and to serve the health educational field generally, including the education of adults as well as children—all social and economic strata—the various industries and professions.

There is really no reason why those of us who are in the field of public

health education should not take a leaf out of the book of the circus people and capitalize on human curiosity. Why should the selling skills be the property of the nostrum venders, the quacks, and the self-aggrandizing cultists. We can adapt their skills for the service of man and the conservation of health just as well as they can use these skills for his exploitation. Nor are we concerned with a theoretical consideration. The Museum of Hygiene, as we have conceived it here, has already played a very important part in the education of the German people. The museum at Dresden and its exhibitions have after all been in operation 25 years, and have during this time become established, accepted institutions in that country. Every year hundreds of thousands of people flock to its doors. Its services are extended throughout Europe with travelling exhibitions large and small which take its message to additional millions. Sizable revenues are derived from admission fees to these shows. Certainly, the methods evolved by the museum at Dresden and its branches have worked, and there is no reason why they should not succeed equally well in a country like our own where similar conditions prevail as to literacy, innate curiosity, and an emphasis on obtaining knowledge through sight and the other senses.

England also has recognized the importance of mass health education to national well-being. This very month (October) there begins in that country an ambitious program under the direction of the Ministry of Health, which is designed to secure for the people the fullest possible use of all health and medical facilities. The Central Council of Health Education, which coördinates all health education services, official and voluntary, will assist in this campaign, drawing upon its successful experience in teaching health to the masses through the medium of exhibits.

We have then in America a grand opportunity to capitalize on these experiences of our foreign confreres, adapting the best in their programs to our conditions and our psychology, and making our own contributions to further progress in this field. The United States is noted for its development of mass production and mass distribution in many fields. In the field of life conservation, production of knowledge has outstripped distribution.

The warehouses of our knowledge are full to overflowing. The time has come to put this knowledge into the hands of those millions for whom it was produced. We look forward to the next decade, during which time a new piece of machinery for the dissemination of knowledge will be created which we hope will be worthy of the vast sums of money and the patient scientific labors which have been expended in producing this life saving knowledge.

Puerperal Sepsis and Its Prevention

MATERNAL mortality and morbidity, both of which present little evidence of decrease in civilised countries in spite of the improvement in the general health, continue to cause grave concern, not only to obstetricians but also to governments. The principal reaction so far as the latter are concerned has been to institute elaborate statistical enquiries into the causes of death and disablement in childbirth. Many reports on these investigations have now been published comprising, in the aggregate, the statistical study of an enormous number of cases. It must be said, unfortunately, that they have not contributed very much to the solution of the problem. They have merely defined it and its extent but have given little or no indication of how improvement may be obtained.

In the case of puerperal infections, bacteriological research has, however, given somewhat more assistance. We now know that the haemolytic streptococcus is responsible for 39 per cent of the severe cases and for 69 per cent of the deaths which are due to infection. Second in importance are

the anaerobic streptococci which are responsible for 29 per cent of the cases and for 8 per cent of the deaths. Third in order of importance are the coliform bacilli responsible primarily for pyelitis and cystitis which comprise about 20 per cent of the pyrexias associated with childbirth and also for a proportion of uterine infections.

There is now an overwhelming body of evidence showing that the haemolytic streptococci causing puerperal infections are of exogenous origin and derived in most instances from the nasopharynx of an attendant at the time of delivery, occasionally from the patient's own nasopharynx and more rarely infection of some kind in the home.

On the other hand, the anaerobic streptococci are probably of endogenous origin derived from organisms present in the vagina before delivery which are introduced into the uterine cavity by intrauterine manipulation during delivery. The coliform infections are almost certainly derived from the bowel. . . . Ronald Hare, M.D. *Canad. Pub. Health J.*, Dec., 1937.

Scarlet Fever Immunization with Formalinized Toxin*

A Preliminary Report

GAYLORD W. ANDERSON, M.D., F.A.P.H.A.

Massachusetts Department of Public Health, Boston, Mass.

IMMUNIZATION against scarlet fever through the use of the Dick toxin has found but limited application because of the number of the injections required and the severity of the attendant reactions. If this disease is to be attacked through widespread immunization as was diphtheria there is need for an immunizing agent which can be administered without reactions and which will consequently be as readily accepted by the public as is diphtheria immunization. The early reports of Veldee on the use of formalinized toxin were sufficiently encouraging to warrant a more extensive trial. Veldee reported that over 80 per cent of the susceptible children given 3 injections of this solution were rendered Dick negative when retested 1 month after the last injection. After a preliminary observation of this material as used by Veldee in certain Massachusetts institutions permission

was obtained from the Scarlet Fever Committee for its manufacture and use on an experimental basis.

PREPARATION OF FORMALINIZED TOXIN

Toxin is produced by growing the Dochez NY 5 scarlet fever streptococcus in veal infusion broth to which is added 2 per cent dextrose. The growth of the streptococci produces acid from the dextrose, necessitating periodic neutralization with sodium hydroxide. Both the method of adding dextrose and the method of adjusting the reaction of the broth have varied during the study. The potency of the toxin produced has ranged from 150,000 to 200,000 S.T.D. per c.c. The streptococci are removed from the toxin by filtration through paper and Berkefeld filter. The filtrate is incubated at $37\frac{1}{2}^{\circ}$ C. in the presence of 0.4 per cent formalin for approximately 100 days. The fall in residual toxin is followed by means of skin tests on rabbits until a low enough level is reached to permit use of the material. The amount of residual toxin is then accurately determined by skin tests on humans who show positive Dick tests. Each lot has been tested on not less than 12 such individuals; usually more than 12. The residual toxin of lots used in the

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

NOTE: This report is of work carried on jointly by the Divisions of Biological Laboratories and Communicable Diseases, the author appearing merely as the spokesman for the department. Credit belongs to the entire staff of the divisions as well as to the health officials of the various communities and institutions in which these studies have been conducted.

study has varied from 500 to 1,500 skin test doses per c.c. The antigen has been given in doses of 0.1 c.c., 0.5 c.c., and 1.0 c.c. at intervals of 3 weeks, the first 2 doses being diluted to 1 c.c. volume for ease of administration.

METHOD OF STUDY

During the winter of 1931-1932 the use of this material was observed in 3 Massachusetts institutions. As it was then apparent that it could be administered safely and without undue reactions, and that through its use a reasonable proportion of susceptibles were rendered Dick negative, the administration of formalinized toxin was made routine in the 3 hospitals for tuberculous children under the auspices of the Massachusetts Department of Public Health. During the winter of 1933-1934 community-wide programs were instituted in Wellesley and East Bridgewater. Similar programs have since been conducted in Bridgewater, Framingham, Gloucester, Greenfield, Rockport, and the towns in the southern Berkshire Health District.

Although no attempt was made to urge parents to have their children tested and given the immunizing agent if found susceptible, the popular acceptance was so great in the communities where it was offered that in some cases more than half of the susceptible school population was given the injections. The high proportion of the child population so immunized may have so influenced the spread of scarlet fever in the community that neither the immunized nor the non-immunized had the usual number of infecting exposures, which would mean that the value of the injections was not being effectively tested. Consequently the later studies in Worcester, Fall River, and Springfield have been planned to reach so small a fraction of the group as to avoid the possibility of interfering with the spread of the disease and thereby re-

ducing the chance of exposure of the immunized children. This selection of a small group for immunization has been accomplished through offering the immunization only in the parochial schools of these cities, leaving the public schools and a portion of each parochial school unprotected. In no community has there been any deliberate selection of children, the injections being given to all children whose parents signed written requests. As these request slips have been distributed to the parents of all children eligible for immunization, the selection has been determined entirely by parental reaction to the request.

In addition to the use of the formalinized toxin as above noted, it has been administered to all the susceptible children in some dozen orphanages and children's schools. Similarly it has replaced the use of the Dick toxin for the immunization of nurses in several training schools. No attempt is made at this time to analyze the results in these groups other than to state that with one or two exceptions the institutions have been free of scarlet fever and the nurses' training schools have been uniformly enthusiastic as to the value of the formalinized toxin and the freedom from reactions.

In order to achieve uniformity of results, and in keeping with the agreement with the Scarlet Fever Committee, all of the testing and immunizing have been conducted under the immediate supervision of the staff of the Massachusetts Department of Public Health. In all of the community-wide programs the Dick tests have been performed and read by members of the staff, except that in Wellesley and Framingham about 100 children were given the test injections by the family physicians but the results read by a member of the department. With few exceptions the tests have all been read by Drs. Feemster, Gilman, and Poutas.

All of the immunizations were given by or in the presence of staff members. A similar procedure was carried on in orphanages, boarding schools, and nurses' training schools. In the 3 state hospitals for tuberculous children and the 3 schools for feeble-minded children, the preliminary Dick tests and immunizing injections were given by members of the institutional staff, but all subsequent testing was done by the same group as did the testing in the community studies. There is thus a high degree of uniformity of procedure underlying the data here presented.

In carrying on the Dick tests one or two departures have been made from the procedures recommended by the Dicks. The syringes used were sterilized by being boiled in tap water but thoroughly flushed with test toxin before use. Platinum needles were used and flamed in an alcohol lamp before each use. The high percentage of susceptibles found on the original Dick test in certain communities (over 80 per cent in Wellesley) would indicate that these procedures have not seriously affected the accuracy of the readings of the Dick test. All immunizing injections were given with the Vim-Forsbeck apparatus which had been sterilized by boiling in tap water.

In the early studies the Dick test was performed without the benefit of a control injection. It later became apparent that a certain proportion of those immunized with formalinized toxin had a false positive reaction on retest due to the large amount of protein in the solution. Consequently during the latter portion of the studies all retests have been accompanied by a control test on the opposite arm with a toxin solution autoclaved at 120° C. for 1 hour. No child in whom the control test was a deciding factor in classifying it as Dick negative after injection has subsequently developed scarlet fever. Control injections were also given to

a large proportion of the children at the time of the original test before immunization. The number found with a pseudo-reaction before immunization is too small to warrant the routine use of the control test for this group, except perhaps on adults or adolescents.

In determining the attack rate of scarlet fever among the immunized no attempt has been made to check the accuracy of the diagnoses. All cases of scarlet fever reported to the local board of health by physicians have been included in the tabulations. Thus the cases in immunized and non-immunized children are based on the same criteria of diagnosis. In the few cases of scarlet fever in immunized children seen by a representative of the department the findings were such as to warrant reasonable doubt as to the accuracy of the diagnosis. In every such case the diagnosis of scarlet fever was accepted to avoid a possibly biased selection. In several other cases there was also reasonable doubt as to the accuracy of the diagnosis. To have excluded these or to have checked as to accuracy of the diagnosis among the immunized children alone would have rendered the immunized group not comparable with the control.

Exclusive of the institutional and nursing groups, preliminary Dick tests have been given to over 14,000 children, of whom 63 per cent have been found positive. Of those who began the immunizing injections, 8,212 received the complete course of 3 injections.*

In order to calculate the effect of the 3 injections of formalinized toxin in protecting a previously susceptible child against subsequent clinically recognizable scarlet fever, an attempt has

* In addition to the above groups, 7,009 children were tested in Fall River and Springfield late in 1936, and 2,969 given the complete course of 3 injections. These have not been included in the data here reported as they have been in the study only a few months.

been made to calculate risk on the basis of child-months of exposure. Thus an immunized child that has been in the study for 36 months is assumed to have had 36 child-months of exposure. Similarly a child in the same community that was not immunized until 2 years after the beginning of the study is assumed to have had 24 months of exposure as a non-immunized child and 12 months as an immunized. Owing to the variations in risk of scarlet fever at different age levels, all calculations of exposure have been reduced to individual years of life. Thus a child immunized at the age of 5 has a certain number of child-months of exposure as a 5 year old; a year later becomes a 6 year old and has 12 child-months of exposure as such and a year later is calculated as a 7 year old. In each community the calculation dates back to the time when the program began in that particular community. Thus in Wellesley where the work began late in 1933, both immunized and control groups have been observed longer than in a community such as Greenfield where the study did not begin until 1935.

A child has been considered as immunized 3 months after the last injection. During the course of the immunization and the 3 subsequent months it has been carried in the non-immunized group. Similarly an immunized child has been considered as one who has received the 3 injections regardless of the results of the subsequent Dick test; children receiving only 1 or 2 injections have been classified as non-immunized. Thus the data here presented measure the protection that is conferred upon a group of known susceptible children by the 3 injections of formalinized toxin.

In all cases the control group has been calculated on the basis of the difference between the known tested group and the census population at that age.

It has been assumed that the same proportion of this residual group is susceptible to scarlet fever as was found in the group tested. That the group tested was a representative sample of the population is shown by comparable measles attack rates among the tested and residual non-tested group. It is realized that this means of estimating the control group is subject to a considerable hazard of errors, but it presented the only available method in view of our obvious inability to test but leave unimmunized a large control group.

IMMUNITY AS MEASURED BY SUBSEQUENT DICK TESTS

All of the children to whom formalinized toxin was administered had been found to be susceptible as determined by a previous Dick test, usually performed the day before the first dose of antigen was given. Subsequent Dick tests thus measure the ability of the solution to render Dick negative a person known to have been previously Dick positive.

The early institutional data of Veldee as observed by us in Massachusetts indicated that over 80 per cent of those injected were rendered Dick negative. Subsequent studies in communities failed to bear out these early institutional findings, nor were the later results in institutions as favorable. The early observations in East Bridgewater and Wellesley were based on retests 2 to 3 months after the last injection. The first retest in Worcester was somewhat variable as to individual schools but averaged about 9 months after the last injection. The remainder, except for Bridgewater, which is discussed below, were performed 10-13 months after the last injection. Data are still lacking as to the most significant time interval at which to make these tests. As will be observed from Table I the retests show that approximately 50 per cent

TABLE I

*Immunizing Effect of Formalinized Toxin
Measured by Dick Tests*

	<i>Tested</i>	<i>Dick Negative</i>	<i>Per cent Negative</i>
0- 4	495	220	44
5- 9	2,873	1,455	50
10-14	1,415	805	57
	4,783	2,480	52

All children Dick positive before being given formalinized toxin.

of those injected have been rendered Dick negative. Anything more exact than this generalization would be unwarranted as the variations between communities and within the same community have been too great, ranging from 21 per cent to over 60 per cent. The low figures of Bridgewater (30 per cent) are of special significance as they represent a deliberate attempt to test the immunizing effect of the formalinized toxin in the presence of minimum exposure to streptococci. This community of 10,000 population was selected as it had been free of recognized scarlet fever during the previous winter and thus represented a group in which the incidence of streptococci was supposedly at a minimum. The group was tested and immunization started June 7, 1935; it was retested October 30 of that same year during which time there was no known scarlet fever in the community. Thus the figures are based on observations during the season of minimum scarlet fever in a community with minimum infection. The low percentage of children rendered Dick negative (30 per cent) probably represents as nearly as possible the true immunizing effect of the antigen in the absence of reinforcement from exposure to hemolytic streptococci. It is not clear what may be the other factors in determining the level of protection established in a community.

Retest of a small group of children given a second course of injections

after being found Dick positive subsequent to the first series of injections showed that over 90 per cent of these children were rendered Dick negative. The figures are too small to be significant, but raise a reasonable question as to the added protection which might accrue from further injections of formalinized toxin.

PREVENTION OF SCARLET FEVER

The ultimate test of the value of the formalinized toxin depends upon its efficacy in the prevention of scarlet fever. As there is no readily applicable laboratory test upon which one may depend for diagnosis, reliance must be placed solely upon clinical interpretation, even though it is recognized that this is attended with many errors. As the same basis was used for diagnosis of both immunized and non-immunized groups this error is largely eliminated except for the possibility that the local physicians who believed in the value of the antigen might have been reluctant to make a diagnosis of scarlet fever in an immunized child and *vice versa*. Such a possibility can be neither denied nor affirmed though it is our belief that there has been no such weighting of the data in favor of the immunized group.

As an attempt has been made to reduce all observations to the basis of child-months of exposure at the different age limits, all rates have been calculated on the basis of 1,000 child-months of exposure. The small number of cases of scarlet fever that have occurred at each age level in any community introduces rather high variability to the age specific rates. Table II presents a sample of such rates for one community, Greenfield. It is, however, of significance that of a total of 73 possible comparisons in age specific rates that could be made in all the communities included in this study, 62 showed a lower rate among the im-

TABLE II
Scarlet Fever in Greenfield

	Immunized			Non-Immunized		
	Child Months Exposure	Cases Scarlet Fever	Rate per 1,000 Child Months	Child Months Exposure	Cases Scarlet Fever	Rate per 1,000 Child Months
<1	7	0		2,351	0	0.0
1	51	0		4,304	1	0.2
2	84	0		4,239	1	0.2
3	90	0		4,581	0	0.0
4	146	0		4,478	3	0.7
5	288	0		5,046	4	0.8
6	924	0		5,151	1	0.2
7	1,755	3	1.7	2,003	2	0.7
8	2,261	2	0.9	2,584	1	0.4
9	2,233	0		2,403	0	0.0
10	2,179	0		2,167	4	0.2
11	2,084	1	0.5	1,875	2	0.5
12	1,863	0		1,894	1	0.5
13	1,203	0		2,567	0	0.0
14	415	0		2,738	2	0.7

munized group. No comparison has been made if no case occurred in either group. Had there been no immunizing effect from this antigen there would have been approximately only 37 comparisons in which the rates would have been lower in the immunized groups. Some significance can be attached to such a sum of many observations, no one of which is of itself significant.

More valuable data can be obtained from summation of the data of individual communities. In doing so it has seemed fairer to treat the data for Worcester separately as in this community there was a different basis for selection of children to be immunized and the scarlet fever rate throughout the study was markedly in excess of that for the other communities. Were the Worcester data to be listed with the others, the major portion of the control group would have been composed of these Worcester children exposed to greater risk than the remainder, whereas, owing to the limitation of immunization to the parochial schools, the number of immunized chil-

dren for Worcester would have been but a very small fraction of the total. Thus the control group would have been unduly weighted with children subject to greater exposure and not strictly comparable with the immunized group. Summation of the remaining data has appeared reasonable as the scarlet fever rates in these several communities have not been too dissimilar and the proportion of the total child population immunized has been fairly comparable. All data included have been from the initiation of the studies in the several communities until July 1, 1937.

Table III shows all summarized observations in the grouped communities and the rates in the immunized and non-immunized groups.

Study of the incidence of scarlet fever cases in these communities may also be made through analysis of the hypothesis that the immunization program had no effect upon the incidence of the disease. This, indeed, is the basic hypothesis which should always be factually repudiated before its alternatives merit consideration. If the im-

TABLE III

Summary of Scarlet Fever Attack Rates in All Communities Except Worcester

	Immunized			Non-Immunized		
	<i>Child Months Exposure</i>	<i>Cases Scarlet Fever</i>	<i>Rate per 1,000 Child Months</i>	<i>Child Months Exposure</i>	<i>Cases Scarlet Fever</i>	<i>Rate per 1,000 Child Months</i>
<1	105	0	...	17,227	2	0.1
1	834	0	...	34,933	1	0.03
2	3,381	0	...	32,756	7	0.2
3	4,151	2	0.5	30,368	18	0.6
4	5,598	1	0.2	28,264	19	0.7
5	7,062	7	1.0	27,142	22	0.8
6	11,472	2	0.2	21,284	24	1.1
7	15,066	11	0.7	16,896	9	0.5
8	16,211	6	0.4	14,970	13	0.9
9	15,134	3	0.2	14,926	11	0.7
10	14,905	4	0.3	13,098	14	1.1
11	14,001	3	0.2	12,088	10	0.8
12	11,816	1	0.1	12,358	8	0.6
13	7,658	2	0.3	14,549	5	0.3
14	3,422	1	0.3	15,827	8	0.5

TABLE IV

*Scarlet Fever Attack Rates
All Communities Except Worcester*

	<i>Total Child Months Exposure</i>	<i>Total Cases</i>	<i>Cases per 1,000 Child Months</i>	<i>Child Months Exposure Immunized Children</i>	<i>Expected Number Cases in Immunized Children</i>	<i>Actual Number Cases in Immunized Children</i>
<1	17,332	2	0.1	105	...	0
1	35,767	1	0.03	834	...	0
2	35,137	7	0.2	2,381	0.5	0
3	34,519	20	0.6	4,151	2.4	2
4	33,862	20	0.6	5,598	3.3	1
5	34,204	29	0.8	7,062	6.0	7
6	32,756	26	0.8	11,472	9.1	2
7	31,962	20	0.6	15,066	9.4	11
8	31,181	19	0.6	16,211	9.9	6
9	30,060	14	0.5	15,134	7.0	3
10	28,003	18	0.6	14,905	9.6	4
11	26,089	13	0.5	14,001	7.0	3
12	24,174	9	0.4	11,816	4.3	1
13	22,207	7	0.3	7,658	2.4	2
14	19,249	9	0.5	3,422	1.6	1
					71.5	43

TABLE IVA

*Summary of Scarlet Fever in
All Communities Except Worcester*

Expected Cases in Immunized Group.....	71.5
Actual Cases.....	43

TABLE V
Scarlet Fever in Worcester

Immunized				Non-Immunized					
				Parochial Schools			Public Schools		
	Child Months Exposure	Cases Scarlet Fever	Rate per 1,000 Child Months	Child Months Exposure	Cases Scarlet Fever	Rate per 1,000 Child Months	Child Months Exposure	Cases Scarlet Fever	Rate per 1,000 Child Months
<1	0	0	...	....	..	...	.....	...	...
1	11	0	...	....	..	...	.....	...	...
2	61	0	...	....	..	...	.....	...	...
3	122	1	0.1	....	..	...	.....	...	...
4	231	0	...	....	..	...	.....	...	...
5	671	0	...	4,588	16	3.5	38,561	135	3.5
6	1,691	2	1.2	6,419	22	3.4	33,523	142	4.2
7	2,529	1	0.4	9,673	13	1.4	26,546	101	3.9
8	2,651	0	...	6,929	14	2.0	26,094	93	3.6
9	2,573	0	...	5,843	5	0.9	24,267	57	2.3
10	2,312	1	0.4	7,575	9	1.2	20,245	47	2.3
11	2,048	0	...	8,484	6	0.7	26,455	44	1.7
12	2,001	0	...	7,425	0	...	14,634	30	2.1
13	1,708	0	...	5,042	4	0.8	14,931	29	1.9
14	1,100	0	...	814	1	1.2	16,429	22	1.3

TABLE VI
Scarlet Fever Attack Rates
in Worcester

	Total Child Months Exposure	Total Cases	Cases per 1,000 Child Months	Child Months Exposure Immunized Children	Expected Number Cases in Immunized Children	Actual Number Cases in Immunized Children
<1	30,996	7	0.2	0	0.0	0
1	50,866	30	0.6	11	0.0	0
2	48,083	78	1.6	61	0.1	0
3	45,295	109	2.4	122	0.3	1
4	42,547	112	2.6	231	0.6	0
5	43,820	151	3.4	671	2.3	0
6	41,630	166	4.0	1,691	6.7	2
7	38,748	115	3.0	2,529	7.5	1
8	35,674	107	3.0	2,651	8.0	0
9	32,683	62	1.9	2,573	4.9	0
10	30,132	57	1.9	2,312	4.4	1
11	26,987	50	1.9	2,048	3.8	0
12	24,060	30	1.2	2,001	2.5	0
13	21,681	35	1.5	1,708	2.6	0
14	18,343	23	1.3	1,100	1.4	0
0-14					45.1	5
5-14					44.1	4

TABLE VII
Scarlet Fever Attack Rates
in Worcester Parochial Schools

	Total Child Months Exposure	Total Cases	Cases per 1,000 Child Months	Child Months Exposure Immunized Children	Expected Number Cases in Immunized Children	Actual Number Cases in Immunized Children
<1			No			
1			Immunization			
2			Program			
3			in Preschool			
4			Group			
5	5,259	16	3.0	671	2.0	0
6	8,110	24	3.0	1,691	5.0	.2
7	12,202	14	1.1	2,529	2.9	1
8	9,580	14	1.5	2,651	3.9	0
9	8,416	5	0.6	2,573	1.5	0
10	9,887	10	1.0	2,312	2.3	1
11	10,532	6	0.6	2,048	1.2	0
12	9,426	0	0.0	2,001	0.0	0
13	6,750	4	0.8	1,708	1.4	0
14	1,914	1	0.5	1,100	0.6	0
					20.8	4

TABLE VIIA
Summary of Scarlet Fever in Worcester

Expected Cases in Immunized Group Based on Rate for Entire City.....	45.1	} 0-14 yrs.
Actual Cases	5.	
Expected Cases in Immunized Group Based on Rate for Entire City.....	44.1	} 5-14 yrs.
Actual Cases	4.	
Expected Cases in Immunized Group Based on Rate for Parochial Schools.....	20.8	} 5-14 yrs.
Actual Cases (same age group).....	4.	

munizing program had been without effect on the incidence of scarlet fever in the communities under consideration, then the incidence rate for each age class may be secured from the recorded cases and computed child-months of exposure. These age specific rates may then be applied to the child-months of exposure for the immunized group to compute the expected number of cases in that group assuming no effect of the immunizing program. From Table IV

it will be seen that but 43 cases occurred as compared with an expected total of 71. It is thus apparent that although there were failures of immunization, there was a distinct reduction in the incidence of scarlet fever in the immunized group.

The data for Worcester are analyzed separately in Tables V to VII. In this city (190,000 population) the immunized group (parochial school children) may be compared with either the

non-immunized parochial school group or with the public school group. Comparison of attack rates shows significantly lower rates among the immunized than among either control group. By comparing the number of cases that occurred in the immunized group with the expected number of cases as calculated from the total community incidence (Table VI) it will be seen that there were but 5 instead of the expected 45. The comparison between the cases among the immunized and the expected number based on the rate for the entire parochial school system is also significant. Whether or not the lower rate of scarlet fever in the parochial schools be due to less adequate diagnosis or reporting, or to an actual reduction attributable to immunization of about one-third of the susceptibles (see below) is a matter that cannot be answered as yet, though there is evidence to suggest the latter. The comparison with the expected number of cases as determined by the rate in the parochial schools is therefore of greater significance than is the other comparison, as the groups are certainly comparable with respect to diagnosis and reporting. This comparison shows but 4* cases instead of the expected 21 (Table VII).

FAILURES OF IMMUNIZATION

As may be observed from the tables there have been 48 children in the communities studied who have been reported as having scarlet fever at some time after the 3 injections of formalinized toxin. Three of these were children who had been tested after im-

munization and found to be still Dick positive but received no further injections. Another had been given a second course of antigen, and one developed scarlet fever a few months after an apparently negative test following immunization. The remainder had not been tested between the date of the last injection and the occurrence of the scarlet fever.

Of this latter group it has been possible to retest 10 children some few months after the scarlet fever. Eight of these were found to be still Dick positive. Several explanations may be advanced to explain these findings— infection due to a different strain of streptococci, error of diagnosis, or the existence of a group of individuals incapable of developing antibodies.

DURATION OF IMMUNITY

It is impossible at present to advance any significant data as to the duration of immunity induced by formalinized toxin. The community studies have been carried on for too short a time, and too few of those originally immunized have reappeared for testing to yield data of value. Institutional data, which have not been included in this report show, however, no significant tendency to relapse to a Dick positive reaction.

REACTIONS

Reactions following the administration of the formalinized toxin have been so mild that there has been as hearty acceptance of this immunizing procedure as has been accorded to diphtheria immunization in the same communities. This is especially significant as no attempt has been made to urge its acceptance and no promises made as to its effectiveness. The opinion of the school teachers who have observed its use in the schools has quite uniformly been that it produced no more severe reactions than followed diph-

* Although the Worcester program attempted to reach only the parochial school children, a few younger brothers and sisters of preschool age were brought to the clinics for immunization. One 3 year old immunized child developed scarlet fever. As there was no control group of this age within the parochial schools, this case has been omitted in this comparison though included with that based on the entire city.

TABLE VIII

*Febrile Response Following Formalinized Toxin Injections
Children in Tuberculosis Hospitals*

		Maximum Temperatures Recorded					
	Observations	Not Over 98.6	98.8 to 99.6	99.8 to 100.6	100.8 to 101.6	101.8 to 102.6	102.8 Plus
2nd Day Before Injection	2,254	66%	32%	2.1%	0.4%	0.1%	0.04%
1st Day Before Injection	2,254	64	34	2.1	0.2	0.1	0.1
Day of Injection	2,253	60	35	3.3	1.1	0.3	0.04
1st Day After Injection	2,252	53	39	5.6	1.2	0.6	0.1
2nd Day After Injection	2,250	61	36	2.6	0.6	0.2	0.04

theria toxoid administration. Our personal observations in both institutional and community-wide programs would bear out this opinion except for a somewhat more extensive area of erythema which was, however, devoid of tenderness. Subjective symptoms are rarely encountered.

In order to obtain more objective data as to the reactions following the administration of this antigen, studies have been made of the maximum temperatures observed routinely in tuberculous children at the time of such injection. From Table VIII it will be observed that there was but a slight increase in febrile reactions. Thus of 2,250 observations the number with a normal temperature after injection fell to but 53 per cent as compared with 64 per cent before injection. The percentage with less than 1° rise increased from 33 per cent to 39 per cent, and those with more than 1° rise increased from 2.5 per cent to 7.5 per cent. Thus when we compare the population showing a febrile reaction after immunization with those showing such temperatures during the 2 days preceding the injection (rather than attributing to the antigen all subsequent disturbances) we find that there was barely 10 per cent increase of febrile disturbances which might be attributed to the injection.

Subjective symptoms are more difficult to evaluate. Studies made of school attendance before and after immunization showed no increase in absences even in those groups where as many as 50 per cent of a class were treated. A similar measure of subjective symptoms may be obtained through studies of the percentage of those children who did not complete a course of immunization upon which they had embarked. From Table IX it will be seen that only 11 per cent of those that began the treatments failed to complete the full course. These figures are comparable to those for diphtheria toxoid clinics in Massachusetts in which from 10 to 20 per cent fail to take the complete course of 3 doses. Thus, it is apparent that the formalinized toxin produces reactions which are not essentially different in severity from those encountered following the administration of diphtheria toxoid.

TABLE IX
Percentage of Children Completing Immunization

Dick Tested	14,337
Dick Positive	9,475
No injections	202
Started course of injections	9,273
Three injections	8,212 (89%)
Two injections only	569 (6%)
One injection only	445 (5%)

CONTROL OF SCARLET FEVER

It would be hazardous to venture any claims as to the effect of the community program in controlling scarlet fever. The findings presented below, although suggestive of some such effect, may be accidental observations which would be reversed over a longer period of time. The data are therefore presented merely for the completeness of the record.

Table X shows the scarlet fever morbidity rates in those communities in which such programs were conducted. The year in which the immunization began is marked with an asterisk. It must be remembered, however, that in most instances the work was not initiated until toward the end of the spring and in some cases not until the fall. Thus the rate during the initial year would not be affected by the program. Cities in which the work did not begin until late in 1936 and the southern Berkshire area, data for which have not been included above, are omitted. It will be noted from the table that except in Worcester where less than 3 per cent of the child population was

immunized there was a quite uniformly lower rate during the post-immunization years than prior. It should be added, however, that the years 1935 and 1936 were years of low incidence of scarlet fever for the state as a whole, though in certain sections the disease was abnormally prevalent.

A better comparison of the incidence of scarlet fever in the immunized and non-immunized communities may be obtained from a study of groups of communities. Such data are included in Table XI. It will be noted that Natick, which lies directly between Wellesley and Framingham and was not immunized (in spite of repeated requests for this service), experienced an unusually high rate of scarlet fever during the same time that its two adjoining communities were unusually free of the disease. A similar phenomenon is apparent in the comparison of Beverly and Gloucester, each a city of about 25,000 population and separated by about 15 miles. Gloucester was selected for immunization because it seemed apparent it should experience a high incidence due to spread

TABLE X
Scarlet Fever Rates in Immunizing Communities

	<i>Bridgewater</i>	<i>East Bridgewater</i> ¹	<i>Framingham</i>	<i>Gloucester</i>	<i>Greenfield</i>	<i>Rockport</i> ²	<i>Wellesley</i>	<i>Worcester</i> ³
1925	424	197	662	167	550	102	218	251
1926	107	169	253	89	372	77	197	248
1927	431	168	245	333	729	1,156	564	254
1928	109	112	811	276	260	508	76	172
1929	164	56	875	203	226	54	144	195
1930	144	83	431	474	168	221	242	324
1931	100	250	333	160	193	84	283	525
1932	212	277	247	126	256	602	488	592
1933	308	2,679	405	186	109	87	264*	317
1934	46	1,598*	229*	64	51	29	313	281*
1935	43*	190	122	25*	93*	0*	96	382
1936	32	325	189	57	106	110	193	245

* Immunization program began

¹ Extensive milk-borne outbreak in 1933 with subsequent high community rate due to spread from contact with unrecognized cases

² Community too small for rates to be significant

³ Less than 3 per cent of child population immunized in 1935

TABLE XI
Comparative Scarlet Fever Rates
Selected Communities

	Wellesley	Frammingham	Natick†	Gloucester	Beverly †	Greenfield	Westfield†
1925	218	662	263	167	465	550	77
1926	197	253	214	89	215	372	93
1927	564	245	758	333	509	709	164
1928	76	811	390	276	396	260	122
1929	144	875	282	203	235	226	106
1930	242	431	139	474	290	168	248
1931	283	333	196	160	82	193	40
1932	488	247	324	126	237	256	40
1933	264*	405	285	186	530	109	70
1934	313	229*	261	64	382	51	30
1935	96	122	560	25*	119	93*	54
1936	193	189	710	57	230	106	319

* Immunization began

† Not immunized

from Beverly and the adjoining cities of Peabody and Salem where the disease was unusually prevalent. That after immunization of about one-third of the school children the disease should decline rather than increase may have been due either to chance or to some partial immunizing effect. Similar conclusions hold for Westfield and Greenfield. It had been hoped that immunization work might be carried on in Westfield beginning in April, 1935, as the high incidence of the disease in surrounding communities suggested an early increase in Westfield. The work was not undertaken, however, owing to the refusal of the local board of health to permit such a program. Consequently, the program was initiated in Greenfield, some 50 miles north in the Connecticut Valley. The table shows that scarlet fever which was increasing rapidly throughout the valley did invade Westfield as expected but failed to do so in Greenfield. The data for the first half of 1937 show a continued striking difference between these two communities.

DISCUSSION

From the foregoing preliminary data it is apparent that the formalinized

toxin used in this study has an appreciable immunizing value as measured both by Dick tests and by protection against clinically recognizable scarlet fever. This immunizing effect is not as great as that due to the use of standard 5 injections of Dick toxin which will render Dick negative about 90-95 per cent of those previously susceptible, as shown by the work of numerous investigators. The clinical data for the use of the two antigens are not strictly comparable. The use of the formalinized toxin is, however, attended with so few reactions that it has been accorded a really popular acceptance in all groups to which it has been offered, even though no attempt has been made to persuade the parents to consent to its use. Subsequent programs in the same communities have shown no loss of popular acceptance.

These considerations raise a serious question as to the possible place which such an antigen might occupy as a means of reducing the incidence of scarlet fever on a community-wide basis. The Dick immunizing toxin has not been accorded the popular acceptance which it deserves when judged solely on the basis of its effectiveness. This lack of acceptance is due basically to

the relative severity of the reactions attendant upon its use, which, during the present era of mild scarlet fever, often appear to the public to be little preferable to the disease itself. Thus the Dick toxin, though giving a satisfactory protection to a very high proportion of those to whom it is administered, has failed to reach a sufficient fraction of the susceptible child population. In our experience the formalinized toxin will reach so large a group that, even though a less powerful antigen, its widespread use will result in the protection of an appreciable fraction of the susceptible group. It is unfortunate that administrative considerations should at times supersede scientific values, but practical experience shows that the community value of an immunizing procedure is no greater than the popular acceptance accorded to it. The history of smallpox vaccination has long offered ample proof of this statement, and the history of Dick toxin immunization has, unfortunately, offered further substantiation of it.

Whether or not the community immunizing value of such a solution is measurably greater than would be suggested by the above data is a point that must await further elucidation. Theoretical considerations lead one to the conclusion that immunization of a reasonable fraction of a susceptible population confers an effective herd immunity upon that community. The studies of Godfrey bear out this theory with respect to diphtheria. Observations are still lacking with respect to scarlet fever but our data have at least suggested a community protection greater than might

be expected from the results of the skin tests. Whether or not some of this protection is due to the existence of an effective clinical immunity of a higher level than is shown by tests is a matter which must await further study, though certain data not here included could be advanced in support of such a contention.

It would appear, therefore, that a formalinized toxin solution, though a less powerful antigen than the Dick toxin, might well serve a useful purpose in community-wide programs for the control of scarlet fever. It is far from an ideal antigen but possesses certain advantages which compensate in part for its deficiencies. There is great need for further studies as to improved antigens or improved methods of administration of existing antigens. The studies described above in preliminary form are being continued together with other studies along the lines herein suggested.

CONCLUSIONS

1. Formalinized toxin solution administered as herein described is a less potent immunizing agent than is Dick toxin.
2. About 50 per cent of those susceptibles treated with formalinized toxin are rendered Dick negative, though this figure varies widely in different groups.
3. Control skin tests are essential in the interpretation of Dick tests on persons immunized with formalinized toxin.
4. The incidence of scarlet fever among children given 3 doses of formalinized toxin is substantially lower than in those not so protected.
5. The reactions following the injections were no more severe than those due to diphtheria toxoid.
6. Immunization with formalinized toxin is as readily accepted by the public as is diphtheria immunization.

Result of Active Immunization of Nurses Against Scarlet Fever*

EDWIN H. PLACE, M.D.

Boston City Hospital, Boston, Mass.

ACTIVE immunization against scarlet fever with large doses of toxin has been found universally to render a high proportion of persons negative to the Dick test. Occasional attacks of scarlet fever due to heterologous strains may occur in persons negative to tests with the standard toxin. There is apparently a lack of specificity of the hemolytic streptococci causing various clinical forms of infection in humans. Whether the standard toxin will protect immunized persons against most clinical attacks of scarlet fever, and especially whether such immunized persons are protected against infection or only against the toxin, can be determined only by collected experiences under actual conditions of exposure.

The present report is based on observations of the nurses in the South Department, Boston City Hospital for the past 24 years.

A small group of nurses was immunized by Branch and Edwards early in 1924. Since 1925, the majority of the nurses have been immunized actively against scarlet fever. The Boston City Hospital nurses have been immunized chiefly in the probationary period by the standard method in the Department of Immunology and are assigned to the scarlet fever wards within

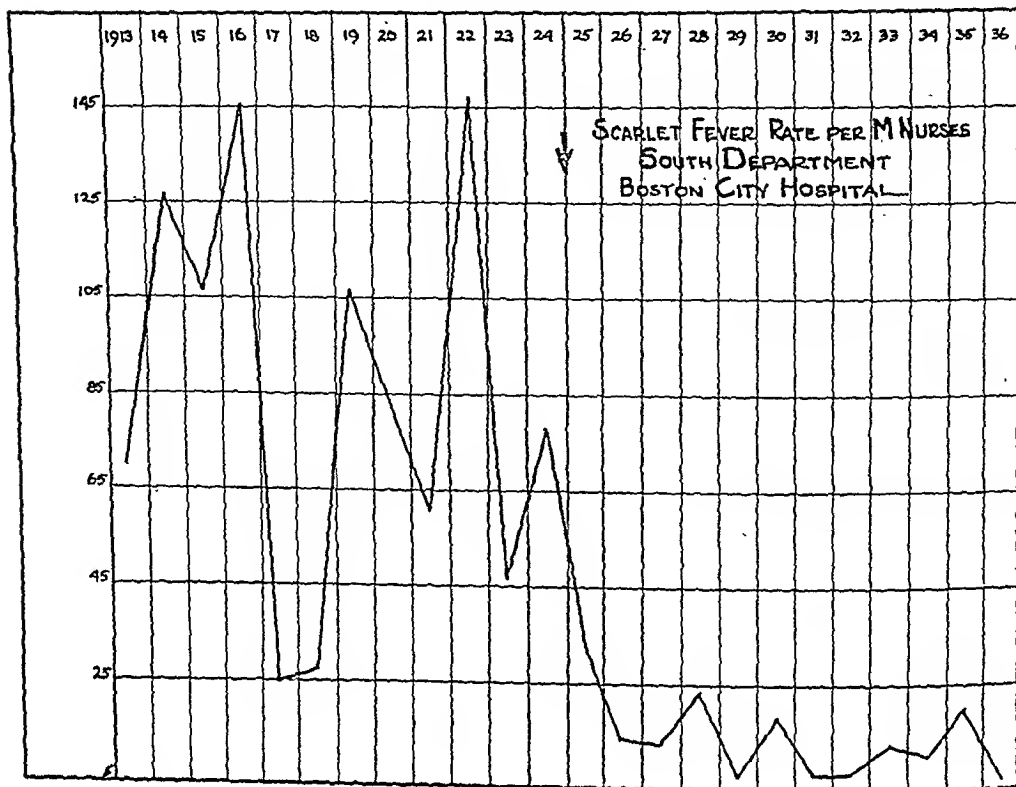
1 to 2 years. Sixty-five per cent of the nurses come from other training schools in Maine, New Hampshire, Vermont, and Massachusetts. Immunizing practice has not been universally good or standard throughout this time in some of these schools.

For the 12 years, 1913-1924, of 1,009 nurses in training 87, or 8.6 per cent, developed scarlet fever. In the following 12 years, 1925-1936, of 1,446 nurses serving in the wards, 20, or 1.3 per cent, contracted scarlet fever, a reduction to 15 per cent of the former rate. Of these 20 nurses, 13 had not been immunized, 3 had had only 500-875 units of toxin, 4½ years, 1 year, and 10 days, respectively, before scarlet fever onset, 1 had received Lilly's Antigen (Larsen) 8 months before scarlet fever, and only 3 had received the complete series of toxin injections. If the completely immunized only were considered in this group the incidence would be 0.21 per cent, a reduction to 0.24 per cent of the former rate.

Of the 3 immunized nurses who developed scarlet fever, 1 never became negative after two series of injections, and the other 2 were not tested after immunization. Two of the 3 had positive Dick tests, 1 before and 1 at the onset of scarlet fever, and 1 was not tested. Only 3 of the 20 cases of scarlet fever were in the Boston City Hospital training school, 2 of which had been immunized with small doses

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

CHART I—Scarlet fever incidence in South Department, Boston City Hospital, nurses per 1,000



and 1 had had a previously negative Dick test a few months before scarlet fever.

Of the 13 non-immunized nurses who developed scarlet fever in the second period, 5 had never been Dick tested, 3 of whom were positive just before or at the attack and 2 negative early in the attack. Three of the 13 had had positive tests but had not been immunized. In 1 the result of the test was not obtainable and 4 had been negative. Of these 4 negative, 2 had positive Dick tests at the South Department and 2 were not tested here. One was reported negative although the nurse noted redness the size of a dime 10 hours later which had faded in 24 hours.

This drop from 8.6 per cent to 1.3 per cent in incidence was not associated with a corresponding decrease of scarlet fever in nurses in general in this region.

One hundred twenty-seven nurses were admitted with scarlet fever in 1913-1924 from hospitals having no contagious services, and in the next 12 years 100 nurses were admitted. Immunization in the hospitals supplying these patients either had not been generally done or had been done only during the last 3-4 years. Forty nurses were admitted from the Boston City Hospital (Proper) in the first (non-immunization) period and 35 in the second period.

The degree of exposure of the nurses in hospital service is subject to great variation and cannot be accurately estimated. The total number of scarlet fever admissions to the hospital and the incidence of scarlet fever in Boston during these 24 years has actually been higher during the period of immunization (Chart I).

In 1922, the training course was re-

duced from 6 months to 3 months. The average time of assignment to the scarlet fever wards in the first period was 41.5 days and in the second period 31.3 days. The difference is actually less significant than this. For example, in the first period 28 per cent of the nurses were assigned to scarlet fever wards for 50 days or more for a total of 50 per cent of the whole nursing time. In the second period, there was much less variation, as only 1.3 per cent served in the scarlet fever wards for 50 days or more for a total of 2 per cent of the whole nursing time of this period. Also, since 1922, nursing contact with scarlet fever occurs more or less constantly

on the isolation wards in addition to scarlet fever wards. An analysis of these conditions fails to indicate any significant factor for the reduction in scarlet fever other than the toxin immunization.

But is the disease occurring unrecognized because of the abolishment of the rash? This is not so easily determined. In the 12 years before immunization, admissions of nurses with streptococcal infections other than scarlet fever occurred in 65, or 6.4 per cent, and since immunization in 67, or 4.6 per cent.

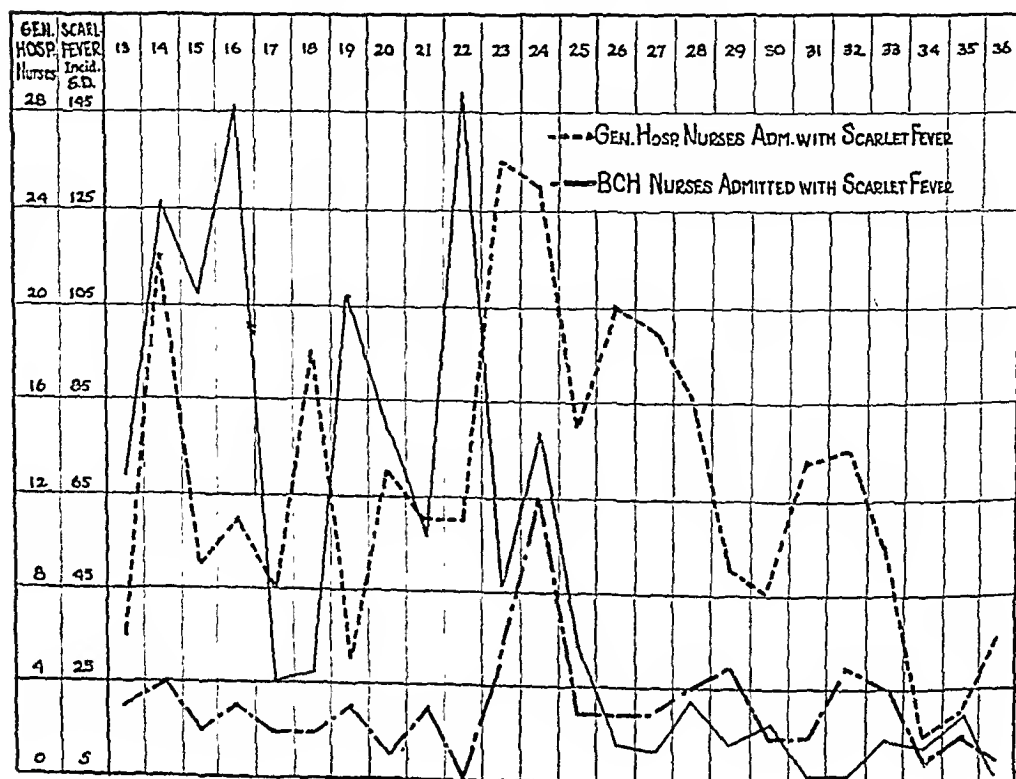
The total loss of time due to all illnesses during the first period was 11.3 days average for each nurse and during

TABLE I

Nurses Contracting Scarlet Fever in South Department, Boston City Hospital, 1913-1936

	<i>Nurses</i>	<i>Nurses Ill Sc. Fev.</i>	<i>Rate per M.</i>	<i>Cases of Sc. Fev. Adm.</i>	<i>Sc. Fev. Morbidity, Boston, per 100,000</i>
1913	71	5	70	801	262.25
1914	63	8	127	846	480
1915	65	7	109	1,080	400.57
1916	94	14	145	574	236.7
1917	78	2	25	531	200.5
1918	69	2	28	391	150.7
1919	122	13	106	693	290.6
1920	98	8	81	576	287.6
1921	101	6	59	693	265.7
1922	75	11	145.6	668	237.3
1923	84	4	47	933	423.1
1924	89	7	78.6	927	504.4
Total	1,009	87	86.2		
1925	87	3	34	708	375.3
1926	75	1	13	783	398.6
1927	84	1	11.9	1,049	532.3
1928	82	2	24.3	763	338
1929	142	1	7	665	353
1930	116	2	17.2	724	336.6
1931	131	1	8.2	903	453.9
1932	121	1	8.2	1,311	624.6
1933	152	2	13.1	1,011	366.3
1934	167	2	11.9	615	235.4
1935	148	3	20.2	543	232.8
1936	141	1	7	762	304.4
Total	1,446	20	13.8		

CHART II—Nurses from general hospitals admitted with scarlet fever compared with incidence in nurses in contagious hospital



the second period 4.8 days. Diphtheria immunization, begun in 1918, accounts for some of this reduction, but comparing 1920-1924 and 1925-1929, shows an average of 7.3 days illness per nurse in the former to 4.2 days for the latter period.

Prevalence of scarlet fever in nurses in the probationary period, before immunization has become fully effective, has shown no increase through contact with nurses who have served in the scarlet fever wards; and the occurrence of scarlet fever in the pediatric wards and in the diphtheria, measles, and whooping cough wards has decreased since immunization.

It is difficult to estimate the number of nurses contracting scarlet fever recognized only because of the rash, who would not even report illness if the rash were not present. From a series of

cases it does not seem probable that it would be as high as 10 per cent.

RÉSUMÉ

The incidence of scarlet fever in nurses in contact with scarlet fever in the South Department, Boston City Hospital, was 86.2 per 1,000 before immunization and 13.8 per 1,000 after immunization comparing 12 year periods. Only 3 of the 20 nurses developing scarlet fever since immunization had had the complete series of immunizing injections. Two of these had not been retested after immunization and one had remained positive after 2 series of injections.

One hundred and twenty-seven nurses were admitted in the first period (1913-1924) with scarlet fever from hospitals not supposed to accept scarlet fever, and 100 such nurses were ad-

TABLE II

Detail Data of Nurses Ill With Scarlet Fever Since Immunization Was Begun

Case	Contag. Service Began	Sc. Fever Ward Assign.	Onset of Sc. Fever	Days After Begin. of Contag. Serv.	Days After Sc. Fever Ward Assign.	Immunized	Prev. Dick
1 A	12- 1-24	2-21-25	1-18-25	49	..	0	..
2 A	1-14-25	2-25-25	3- 8-25	54	12	0	..
3	4-19-25	6-16-25	5-17-25	29	..	875 units 4-17-24	+ 0
4 A	1-14-26	1-21-26	2-11-26	29	22	500 units 2- 1-26	+
5 A	9- 2-27	{ 9- 2-27 to 9-20-27 10-18-27	11- 3-27	63	16	Lilly Antigen 4- 4-27	+
6	2- 5-28	{ 2- 5-28 to 2- 9-28 4- 1-28	4-16-28	71	16	500 units 1925	+
7 A	7- 2-28	{ 7- 2-28 to 7- 3-28 8-11-28	8-19-28	48	5	0	+
8 A	5- 8-29	{ 6-26-29 to 7- 9-29	7-13-29	67	18	0	+
9 A	2- 1-30	3-21-30	2-19-30	19	..	0	+
10 A	10- 1-30	10- 1-30	10-12-30	12	12	0	0
11 A	3-15-31	4-26-31	3-21-31	7	..	+ 1929	+
12 A	11-30-31	1- 2-32	1-22-32	54	21	0	?
13 A	10-14-33	10-27-33	11-13-33	32	18	0	-
14	11- 1-33	11- 1-33	12- 1-33	31	31	0	0
15 A	4-15-34	5-13-34	5-19-34	29	7	0	0
16 A	11- 1-34	{ 11- 1-34 11-30-34 12-23-34	12-26-34	56	4 56	+ 9 mos.	+
17 A	12-30-34	12-30-34	1- 6-35	8	8	0	..
18 A	4- 1-35	4- 1-35	4- 7-35	7	7	Twice 1933	+
19 A	4- 5-35	4- 5-35	4-26-35	22	22	0	0
20 A	2-26-36	3-14-36	4- 8-36	43	26	0	..

A = Nurses from affiliated schools

mitted 1925-1936. In recent years many of these hospitals have begun immunization.

The conditions of contact of nurses with scarlet fever are obviously greatly variable but no significant difference could be made out to account for the striking reduction of prevalence.

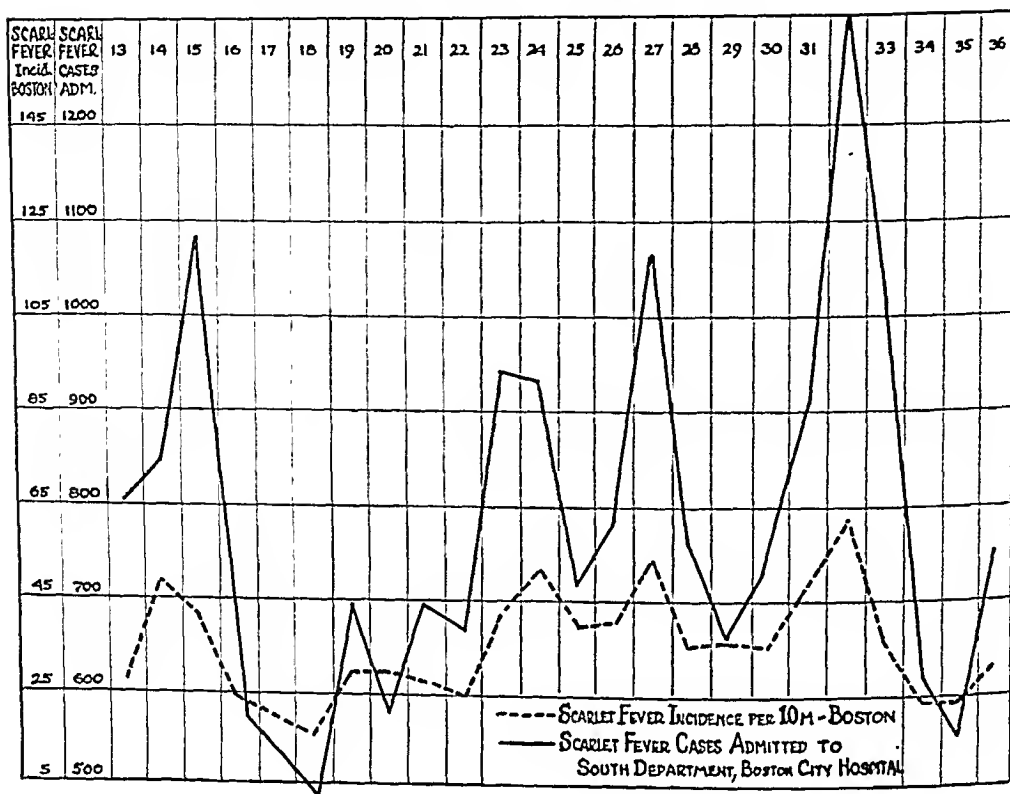
The incidence of streptococcal infections such as tonsillitis, septic sore

throat, erysipelas, and peritonitis (aside from scarlet fever) was 64.4 per 1,000 in the first period, and 46.6 in the period of immunization.

The total loss of time from all illnesses was 11.3 days average in the first period and 4.8 days in the second.

The prevalence of scarlet fever in the children in the pediatric, measles, whooping cough, and diphtheria wards

CHART III—Cases of scarlet fever admitted to South Department, Boston City Hospital, and scarlet fever incidence per 10,000 in Boston



has shown no increase since immunization of nurses.

CONCLUSION

Toxin immunization of nurses carefully done largely abolishes the evidence of scarlet fever during their contagious disease training. There is no evidence that the disease is still occurring in unrecognized form.

BIBLIOGRAPHY

1. Trask, J. D., and Blake, F. G. *J.A.M.A.*, 101:753, 1933.
2. Rhoads, P. S. *J.A.M.A.*, 99:153, 1931.
3. Hannah, Beverly. *Canad. Pub. Health J.*, 25:587, 1934.
4. Hektoen, L., and Johnson, Charlotte. *J.A.M.A.*, 102:41, 1934.
5. Benson, W. T., and Rankin, A. L. K. *Lancet*, 2:1357, 1934.
6. Anderson, G. W., and Reinhardt, W. *J. Infect. Dis.*, 57:136, 1935.
7. Henry, J. N. *J.A.M.A.*, 105:488, 1935.
8. Rappaport, B. *J.A.M.A.*, 106:1076, 1936.
9. Toyoda, T., Moriwaka, J., Furagi, Y., and Okamoto, M. *J. Infect. Dis.*, 46:219, 1930.

Sanitary Aspects of Air Conditioning*

C. P. YAGLOU

Assistant Professor of Industrial Hygiene, Harvard School of Public Health, Boston, Mass.

THIS paper summarizes the comfort, health, and therapeutic aspects of air conditioning in the light of present knowledge and current research.

In the evaluation of these aspects, it is desirable to distinguish between winter and summer air conditioning, since the requirements and the effects of air conditions differ considerably in the two seasons. According to engineering terminology, the functions of winter air conditioning are heating, humidification, air circulation, and filtration; those of summer air conditioning are cooling, dehumidification, circulation, and filtration. These definitions are purely arbitrary in that they do not distinguish between important and unimportant functions.

WINTER AIR CONDITIONING

From the standpoint of comfort and health the problem of winter air conditioning appears to be mainly one of rational heating supplemented with adequate building insulation and with sufficient ventilation, by natural or mechanical means, to remove objectionable body or tobacco smoke odors.

Air and Wall Temperatures—Air temperature and particularly sharp temperature changes are as a rule the most important factors. While a mod-

erate variability of temperature toward the cooler side of the comfort zone is stimulating and probably beneficial, there is much good evidence to show that great temperature changes may have a deleterious influence by increasing susceptibility to upper respiratory diseases. A most difficult problem in winter air conditioning is how to reduce the sudden temperature changes experienced in passing from a warm room to cold outdoor air. Obviously, this is difficult to accomplish with conventional methods and equipment. Some persons believe that the solution of the problem might be found in radiant methods of heating, but so far nothing practical has been achieved.

Next to air temperature, the temperature of the exposed walls and glass is of considerable importance. A room heated by the usual convectional methods may be uncomfortably cool at 75° or even at 80° in cold weather if the insulation of the walls is poor. Owing to a steep temperature gradient between floor and ceiling, the feet are cold and the head is too warm, a condition that is inimical to comfort and health.

Years of experience in England have shown that a combination of warm walls and relatively cool air is distinctly more comfortable and pleasant than one of cold walls and warm air; such an arrangement also reduces to some extent the temperature contrasts between

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

outdoors and indoors. Radiant panel heating methods have distinct advantages in these respects, but their applicability to cold climates involves a number of economic and engineering difficulties that have yet to be overcome. Work now in progress at the John B. Pierce Laboratory of Hygiene, under the direction of Dr. Winslow, may shed considerable light on disputed points.

Suitable wall insulation, in conjunction with convectional heating methods, will materially improve the comfort of a room by reducing infiltration and by keeping the inside surface temperature of the exposed walls close to the air temperature. Such a room would be comfortable at temperatures between 70° and 73° instead of 75° and 80°, in poorly constructed buildings.

Aside from comfort, insulation has important economic aspects. It allows a reduction in the size of the entire heating plant and effects a substantial saving in fuel consumption by reducing structural heat losses and by permitting a lower room temperature.

Humidity — This factor, although very important in warm weather, is of little consequence in cold weather except in special instances. The usual variations of humidity during the heating season have been found to produce little effect on comfort, and from the standpoint of health the evidence is overwhelmingly on the negative side. Subjectively, a low humidity is generally preferred to a high one, especially when the latter is obtained by mechanical methods. Exceptions have been found in persons suffering from frontal sinusitis and other infections of the upper respiratory tract characterized by excessive dryness of the nose. The same subjects, however, disliked the humid air after their condition improved.¹ A low humidity also seems more agreeable than a high one in catarrhal conditions of the nose² but

the data are too meager to allow a definite conclusion. In the light of these suggestive data, a study of the effects of dry and humid atmospheres on upper respiratory disorders may offer a fruitful field for research.

In properly heated buildings, the natural relative humidity seldom falls below 20 per cent owing to a stabilizing influence of hygroscopic materials in the walls, furniture, etc. Artificial humidification may lead to serious trouble from condensation and freezing of the moisture inside certain building materials composing the outside walls. Even in buildings constructed of waterproof materials, relative humidities above 40 per cent are troublesome in cold weather.

Air Movement and Drafts—Within the usual limits, air movement is not a factor of great importance. The aim in ordinary ventilation work is to keep the movement of air at or slightly above the threshold of perceptibility so as to impart a sense of freshness without drafts. Usual practical values are between 15 and 50 f.p.m. during the heating season.

The problem of drafts is difficult to solve to the satisfaction of all because the trouble does not always arise from faulty air conditions but often from an inherent instability of the heat-regulating system of the body, particularly from poor blood circulation to the extremities and deficient vasomotor response in certain individuals. The draft-susceptibles may suffer considerably on exposure to ordinary air conditions that are perfectly satisfactory to the majority of normal persons. Even a temperature of 72° with an air movement of 20 f.p.m. may prove objectionable to some persons who like heat and cannot stand the cold, because of their low metabolic rate. Such individual idiosyncrasies may be counteracted by the use of suitable clothing that will keep the extremities warm.

Few persons, however, would be willing to depart from custom and fashion unless their health is seriously threatened.

Mechanical Ventilation and Air Cleaning—These two factors are very important in theatres, auditoriums, industrial plants, etc., where large volumes of air must be constantly supplied, but in the average home and uncrowded office natural ventilation is sufficient for every practical need, except in the kitchen and bathroom where separate means of ventilation are desirable in order to prevent diffusion of odors to other sections of the building.

According to prevailing belief, the minimum fresh air supply in general ventilation work is that needed to dilute and remove unpleasant body or other odors that have hygienic significance. In experimental work the amount of outside air needed for the removal of body odors was found to vary from 5 to 38 c.f.m. per person, depending largely on the cleanliness of the occupants, the air space per person, and the type of air-conditioning apparatus.³ Under ordinary conditions, a fresh air supply of about 15 c.f.m. per person appears to be quite satisfactory in public buildings when each occupant is allowed an air space of about 200 c.f.m. This quantity is usually sufficient to satisfy the thermal requirements, except in warm weather when the air is not cooled artificially. In all instances, the total air supply, including outside air and recirculated air, must be sufficient to maintain comfortable thermal conditions and to prevent the accumulation of objectionable odors.

In industries where the primary object may be the control of toxic dusts, fumes, or gases, the air supply must be sufficient to dilute the polluting elements to a concentration below the physiological threshold.

So far as ordinary atmospheric dust is concerned, the objection is believed

to be not so much a matter of health as of nuisance and esthetics.⁴

Health and Economic Aspects of Winter Air Conditioning—In the past few years, several studies have been carried out to determine whether winter air conditioning affects favorably the health and efficiency of office workers. The best controlled studies were those of McConnell⁵ at the Metropolitan Life Insurance Company, including a total of 10,000 employees, half working in conditioned offices and the other half in offices not equipped with air-conditioning equipment but otherwise properly heated and ventilated. Records of illness, absenteeism, and other pertinent factors showed no significant difference between the two.

Reports from commercial sources are quite contradictory. Claims are often made of definite benefits to health and efficiency, but the data are too meager and without controls. Such data are probably of little value owing to the well known variability in the incidence of upper respiratory diseases from year to year and month to month.

We must admit at the outset that the evaluation of any specific influence on health is extremely difficult, because of lack of suitable standards and the simultaneous operation of many extraneous factors outside the place of work, some of which have probably a much more powerful influence than the air conditions at work. All we can say at present is that no authentic evidence exists to prove any superiority of winter air conditioning over rational heating in homes and public buildings.

SUMMER AIR CONDITIONING

Cooling in warm weather may contribute much to the comfort or discomfort of man depending upon the method and extent of cooling. Much has yet to be learned about this important branch of air conditioning. Above all, temperature contrasts must not be too

great. An indoor temperature even 10 to 15° F. below the outside temperature, as is now the practice in warm weather, appears to be objectionable and harmful to some persons. We often hear of head colds originating in overcooled theatres, restaurants, or railroad cars on warm summer days. Headaches, stomach upsets, and a general feeling of fatigue are other conditions attributed to overcooling. Although many healthy individuals seem to be perfectly capable of adjusting themselves to such temperature changes, without discomfort or after-effects, little is known about possible damage to health that may result from too frequent exposure.

Adaptation to summer heat renders the organism sensitive to cold and temperature changes, especially when the body surfaces are wet with perspiration. The tone of the heat producing organs is depressed and the metabolic rate may fail to increase sufficiently, or quickly enough, on exposure to sudden chilling.⁶ The "cold shock" experienced on entering a cooled space on a warm day is found to be due to an excessive increase in the heat loss by evaporation of perspiration without an immediate compensatory increase in the metabolic rate.⁷ Conversely, the feeling of depression and discomfort experienced in passing from a cooled space to warm outdoor air appears to be due to a lag in sweat-gland activity and the consequent retention of body heat.

The solution of the problem would seem to lie in dehydrating the air to a comparatively low humidity, without reducing the temperature more than a few degrees below the prevailing outdoor temperature. In this way, temperature contrasts are moderated upon entering and leaving the conditioned space and, according to current research, there are no untoward symptoms in the transitional period of readjustment.

Health and Economic Aspects of Summer Air Conditioning—The benefits of summer cooling in commercial and industrial fields are now generally appreciated. There is much good evidence to show that cooling under adverse conditions of heavy physical work and heat should prove beneficial to both employer and employee by increasing the output, decreasing illness and accidents, and lessening fatigue.⁸ In office work, however, where the physical activity is light, McConnell⁹ was unable to detect any significant improvement in the health or efficiency of approximately 6,000 employees of the Metropolitan Life Insurance Company in the course of a summer season, despite the conspicuous improvement in comfort. The employees were able to pursue their work without the depression and discomfort experienced prior to the installation of cooling apparatus.

For the average home and small office, cooling may be a potential necessity, but for the time being, it is still too expensive for general use. In many sections of the country where the nights are usually cool, suitable building insulation, including the use of awnings, and the circulation of cool night air will generally afford sufficient relief during the heat of the day.

THERAPEUTIC ASPECTS OF AIR CONDITIONING

Aside from comfort and health, air conditioning is proving to be a valuable adjunct in the treatment of disease.¹⁰ In operating rooms, conditioned air is gradually becoming indispensable in reducing the risk of explosion of anesthetic gases and safeguarding the patient, surgeon, and operating team against excessive summer heat.

In premature nurseries of institutions, the maintenance of a suitable temperature, according to individual requirements, with a relative humidity

of about 65 per cent, as determined by extensive research, results in a great reduction in the incidence of respiratory and gastrointestinal diseases, and improvement in the infants' chances for life.

In the artificial production of therapeutic fever, conditioned air is proving to be the preferred method of treatment. In oxygen therapy, air conditioning is concerned with the conservation of oxygen, and the removal of excess carbon dioxide, heat, and moisture.

Hay fevers and pollen asthma offer a wide field for application of air conditioning in the home, office, or clinic, the main objective being adequate filtration of air. Unlike specific desensitization, treatment by conditioned air is not curative but gives only temporary relief. With rare exceptions, the symptoms recur on exposure to pollen-laden air.

Cooling in warm weather is of great assistance in the treatment of pyrexias of the new-born, in enteric disorders, fevers, heat stroke, heart failure, and a variety of other ailments that often accompany summer heat waves. Considerable research is now in progress on a wide variety of diseases in which

air conditioning may prove of value.

Of particular significance to operating rooms and contagious wards is the recent use of ultra-violet light for sterilizing air. This phase of air conditioning will be separately discussed by Mr. Wells¹¹ and need not, therefore, be taken up here.

REFERENCES

1. Yaglou, C. P. Physical and Physiological Principles of Air Conditioning. *J.A.M.A.*, 108:1708, 1937.
2. Hosmer, M. N. Observations on Patients in Air Conditioned Hospital Rooms. *Hospitals*, 10:87, 1936.
3. Yaglou, C. P., Riley, E. C., and Coggins, D. I. Ventilation Requirements. *Am. Soc. Heating and Ventilating Engrs., J. Heating, Piping and Air Conditioning*, 8:65, 1936.
4. Ventilation and Atmospheric Pollution. Rep. Comm. on Ventilation and Atmospheric Pollution. *A.P.H.A. Year Book*, 1934-1935.
5. McConnell, W. J. Investigations of the Health Aspects of Air Conditioning. *Refrig. Eng.*, 31:79, 1936.
6. Ogle, Cornelia, and Mills, C. A. Animal Adaptation to Environmental Temperature Conditions. *Am. J. Physiol.*, 103:606, 1933.
7. Yaglou, C. P. Physical and Physiological Principles of Air Conditioning. Part 2. *J.A.M.A.*, 109:945, 1937.
8. Yaglou, C. P. Abnormal Air Conditions in Industry: Their Effects on Workers and Methods of Control. *J. Indust. Hyg. & Tox.*, 19:12, 1937.
9. McConnell, W. J., and Kagey, I. B. The Air Conditioning System of New Metropolitan Building—First Summer's Experience. *Trans. Am. Soc. Heat. & Vent. Eng.*, 40:217, 1934.
10. Yaglou, C. P. Hospital Air Conditioning. *J. Indust. Hyg. & Tox.*, 18:741, 1936.
11. Wells, William F. Sanitary Ventilation. *A.J.P.H.*, Mar., 1937.

Standard Agar Counts as Compared With Counts on Improved Agars at 32° C.*†

M. W. YALE, PH.D.

Department of Bacteriology, New York State Agricultural Experiment Station, Geneva, N. Y.

THE American Public Health Association has under consideration an improved plating medium and an improved incubation temperature for official use in the bacteriological examination of dairy products. The improved agar which has received most study is a tryptone-glucose-skim milk medium, developed by Bowers and Hucker¹ in 1935. This medium contains 0.5 per cent tryptone (hydrolyzed casein), 0.1 per cent glucose, 0.5 per cent skim milk and 1.5 per cent agar.

At the request of the Committee on Standard Methods for the Examination of Dairy and Food Products, Difco Laboratories, Inc., prepared dehydrated media according to the above formula both with and without milk, and sent trial packages of one or both to 91 laboratories for comparisons with standard nutrient agar. The types of laboratories receiving tryptone media were as follows: milk or ice cream companies, 39; commercial, 5; health and control, 24; and educational institutions, 23. Seven were in foreign countries (England, Denmark, Germany, Syria, Cuba, and Hawaii).

Dr. R. S. Breed, Chairman of the

Standard Methods Committee, asked the author to summarize the data. This summary (Table I) includes 42 reports by 56 laboratories on 23,715 samples of dairy products.

The majority of the laboratories received a tryptone-glucose medium and added 5 ml. of good quality skim milk per liter prior to sterilization. A few laboratories failed to add the milk, but since several studies have shown only a slight increase in count due to the addition of this amount of milk, no distinction is made in Table I between tryptone-glucose and tryptone-glucose-skim milk agar.

Only 14 of the 42 reports have previously been published.¹⁻¹⁴ Of the 28 unpublished reports, 15 were from health or other control laboratories, 7 from laboratories in educational institutions, and 6 from industrial or commercial laboratories. About 50 per cent of the work was done using incubation temperatures of both 37° C. and 32° C. for 48 hours, the latter being one of the improved incubation temperatures under consideration for official use in the examination of dairy products. Some laboratories did not use the lower temperature because 32° C. incubators were not available.

It is not within the scope of this paper to discuss still other modifications used by 15 of the laboratories as indi-

* Read at a Joint Session of the Laboratory and Food and Nutrition Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

† Approved by the Director of the New York State Agricultural Experiment Station for publication as *Journal Paper No. 246*, Jan. 8, 1938.

TABLE I

List of 42 Reports from 56 Laboratories Classifying 23,715 Samples of Dairy Products Examined in a Comparison of Standard Agar and Tryptone-Glucose-Skim Milk (Original Formula) Agar Plate Counts with 32° C. and 37° C. Incubation

Report by	Number of Samples Examined						Modifications Studied					
	Milk			Cream		Ice Cream	Misc.	S. A.		T. G. M.		
	Raw	Past.	Powd.	Raw	Post.			37°	32°	37°	32°	Others
A. Published Reports												
Bowers and Hucker (Geneva) ¹	365	341	...	...	...	...	...	+		+	+
McCready and Archambault (Montreal) ²	40	45	...	...	...	...	...	+		+	+
Safford and Stark (Ithaca) ³	19	190	...	...	...	...	...	+		+	+
Demeter and Löweneck (Germany) ⁴	28	14	...	...	...	...	...		+		+
Bradfield (Burlington) ⁵	684	71	...	...	...	...	47	+	+	+	+
Frazer (Burlington) ⁶	18	...	...	...	...	...	...	+			+
Dennis and Weiser (Columbus) ⁷	37	...	...	...	...	...	...	+	+	+	+
Phelan (Boston) ⁸	617	903	...	198	123	21	60	+	+	+	+	
Kelly (Washington) ⁹	1,164	1,937	...	...	1,147	...	...	+	+	+	+
Curtis and Hileman (Syracuse) ¹⁰	...	...	254	...	...	...	...	+	+	+	+
Babel (Lafayette) ¹¹	...	...	...	...	...	192	...	+		+	+
Robertson (Albany) ¹²	...	...	...	...	...	412	...	+	+	+	+
Yale and Hickey (Geneva) ¹³	...	...	...	...	...	112	...	+		+	+
Yale and Pederson (Geneva) ¹⁴	11	22	...	...	...	...	...	+	+	+	+
Total	2,983	3,523	254	198	1,270	737	107					
B. Unpublished Reports from Health and Other Control Officials												
Mickle * (Hartford)	4	4	...	...	...	...	...	+		+
Reynolds (Washington)	...	91	...	...	...	...	...	+		+
Eglinton (Geneva)	136	134	...	...	153	...	...	+	+	+	+
Stone (Los Angeles)	248	63	...	...	...	...	...	+		+	+
White (Chicago)	118	107	...	14	64	...	...	+	+	+	+
Krog (Plainfield, N. J.)	13	23	...	...	...	...	...	+		+
Parker (Jacksonville)	415	356	...	46	122	...	...	+		+	+
Perry (Baltimore)	156	64	...	...	...	...	...	+		+
Zevin (Tupper Lake, N. Y.)	10	30	...	...	10	...	...	+		+
Mott (Boston)	...	4,796	...	...	...	...	...	+	+	+	+
Hatfield (New York City)	63	55	...	...	50	...	...	+	+	+	+
Hohl (Albany)	47	141	...	...	9	...	...	+		+	+
Milone (Albany)	8	24	...	...	8	...	48	+		+	
Hood (Ottawa)	...	...	...	...	...	81	...	+		+	
Slack (London, Ont.)	100	100	...	...	...	...	...	+		+
Total	1,318	5,988	...	60	416	81	48					
C. Unpublished Reports from Workers in Educational Institutions												
Shutt (Guelph, Ont.)	159	20	...	...	...	...	...	+	+	+	+
Hitchner (Orono)	24	...	...	...	...	...	...	+	+	+	+
Foltz (Manhattan)	...	...	...	...	...	279	...	+	+	+	+
Hammer (Ames)	37	36	...	...	...	...	...	+		+	+
Prucha (Urbana)	236	671	...	...	...	...	...		+	+	+
Johns (Ottawa)	...	45	...	...	...	...	...	+		+	+
Brown (Baltimore)	45	...	...	...	...	...	...	+		+
Yale (Geneva)	4,699	...	...	...	...	...	...	+		+
Total	5,200	772	...	...	...	279	...				
D. Unpublished Reports from the Industry and from Commercial Laboratories												
Sias (Brookline, Mass.)	15	...	...	...	...	...	...	+	+	+	+
Hardenbergh (Plainsboro, N. J.)	280	30	...	...	...	...	...	+		+	+
Charlton (Portland, Ore.)	41	...	...	...	...	...	...	+	+	+	+
Difco (Detroit, Mich.)	...	58	...	...	35	...	...	+	+	+	+
Sealtest (Baltimore)	22	...	...	...	...	...	...	+	+	+	+
Total	358	88	...	...	35	...	...			
Grand Total	9,859	10,371	254	258	1,721	1,097	155					

* Comparisons by 9 laboratories

cated in the right hand column of Table I. Safford and Stark,³ Eglinton, Stone, Perry, Hohl, Brown, and Difco Laboratories tried several improved agars which yielded on the average higher counts than the tryptone agar described in this paper. Some of these modifications show possibilities of an even greater improvement over standard agar than does the formula used in the present research work and merit further consideration.

RESULTS OBTAINED

On the tryptone medium, colonies were larger than on standard agar and easier to count both because of their size and because of the opaqueness of the medium due to the added milk.^{1, 2, 4, 5, 6, 7}

Frayer,⁶ in a study of about 4,000 plate counts made by several technicians on 18 samples, found that counts on replicate tryptone agar plates incubated at 32° C. were less variable than counts on replicate standard agar plates incubated at 37° C.

This is an important point in favor of the modified method since its use would result in greater uniformity in results obtained by different laboratories. The increased accuracy of counting is presumably due to the greater ease with which colonies can be counted on the tryptone medium.

Bowers and Hucker¹ found that mastitis streptococci grew better on the tryptone medium than on standard agar where they grew either as "pinpoint" colonies or not at all. Other studies have shown that these organisms grow equally well at 32° and 37° C.

Yale and Pederson¹⁴ reported that thermophilic bacteria, occasionally present in large numbers in pasteurized milk, do not grow well at either 32° or 37° C. and that a higher incubation temperature than 37° C. is necessary for their best development on agar plates.

Bradfield⁵ discovered that certain types of contamination had a definite relationship to increases in counts developed by modified plating methods. Organisms arising chiefly in the udder responded to the standard agar and 37° C. incubation temperature almost as well as to the modified methods. Types carried into the milk by utensils developed better at the lower incubation temperature and with the modified medium than with the standard procedure. Those derived from feed, bedding, or stable dust developed better at the lower temperature than at 37° C., but there was no advantage for either the modified medium or temperature when the source of contamination was fecal or dermal. Types predominating in improperly cooled milk developed greatly increased counts on the modified medium, particularly when incubated at 32° C.

If it is desirable to use a procedure which will grow bacteria associated with unclean utensils and inadequate cooling, a modified medium and temperature are clearly advantageous.

EFFECT OF MODIFIED METHODS ON COLONY COUNTS

Bowers and Hucker¹ showed in their original work using the modified medium at 37° C. that the average increase in count was greater in pasteurized milk than in raw milk. The majority of reports confirm this finding. Phelan⁸ studied samples collected throughout New England and examined in the laboratories of the Hood Company at Boston. He used the modified medium at both 37° and 32° C. and found striking differences in increases in counts obtained in different classes of dairy products. The least increase occurred in certified raw milk, and the greatest in pasteurized cream where it exceeded 80,000 per cent in almost 1 per cent of the samples tested. Grade B raw milk yielded greater increases

than Grade A raw, and Grade B pasteurized yielded greater increases than Grade A pasteurized. These observations have been confirmed by other workers.

Stone found in the case of California samples that increases due to the modified medium were, on the average, about 30 per cent for raw milk and about 100 per cent for pasteurized milk. In California, increases in count using the modified medium at 37° C. are apparently less than in certain other sections of the country because their milk supplies have been so largely freed of those types of bacteria which fail to grow on standard agar at 37° C. Hardenbergh at Plainsboro, N. J., examined 280 samples of certified raw, and 30 samples of certified pasteurized milk, using a dilution of 1:100, and reported that standard agar counts were higher than tryptone agar counts in the majority of cases. Undoubtedly, the organisms present were almost entirely udder types which grow as well or better on standard nutrient agar than on the modified tryptone medium.

Several millions of dollars are annually paid to Grade A dairymen in this country as premiums for raw milk delivered with a low bacterial count. Yale studied data furnished by 3 New York City and 2 Philadelphia companies on 4,699 samples of Grade A raw milk. From the information obtained, equitable adjustments can be made so that neither producers nor dealers will suffer financial losses if changes are made in plating methods.

While the modified temperature exerts a greater effect on the count than does the modified medium in fluid milk, Curtis and Hileman¹⁰ found that the modified medium had the greater effect on the count in dry skim milk.

The modified incubation temperature is especially advantageous for use with ice cream due to the abundant presence of types with an optimum growth tem-

perature nearer 25° or 32° C. than 37° C. Robertson¹² summarized data furnished by 5 ice cream companies and compared the effect on the count produced by the modified medium and the modified temperature. He concluded that the modified temperature had the greater effect.

Data obtained by the various laboratories listed in Table I are in general agreement. The variety of ways in which results were reported made the preparation of a summary difficult and, for this reason, one outstanding study was selected for discussion rather than the work as a whole.

Kelly⁹ acted as collaborator for the International Association of Milk Dealers in summarizing data collected by 17 milk companies in 10 states. The study was carefully planned in advance and complete directions sent to each laboratory. Through the courtesy of Mr. Kelly and the International Association of Milk Dealers, the cards containing the original data on 4,248 samples of milk and cream were loaned to the author and a frequency distribution table prepared (Table II).

Table II shows the number and percentage of instances in which increases or decreases fall within a certain percentage increase or decrease range. The groupings correspond closely to those used by Bradfield⁵ with the exception that the group designated "no increase or decrease" is slightly broader, taking in minus 5 to plus 5 per cent.

Three points are brought out strikingly by the results shown in Table II. First, the numbers and percentages show that the modified temperature had a greater effect on the count than the modified medium while the combination had a greater effect than either alone. The average percentages of increase or decrease showing the effect of change in incubation temperature, the change in medium, and the combination of the two are +37, -7, and +59 per cent

TABLE II

Distribution of Percentages of Increases or Decreases in Counts by the Modified Methods as Compared to the Standard Method in the Case of 4,248 Samples of Milk and Cream Studied by 17 Milk Companies in 10 States

Percentage Increase or Decrease in Counts	S. A.*—32° C.		T. G. M.†—37° C.		T. G. M.†—32° C.	
	Number of Cases	Per cent	Number of Cases	Per cent	Number of Cases	Per cent
<i>A.—1,164 Samples of Raw Milk</i>						
—50 to —100	16	1	34	3	17	1
—6 to —49	160	14	282	24	103	9
No difference	122	10	150	13	101	9
+6 to +49	417	36	400	34	333	29
+50 to +99	196	17	149	13	238	20
+100 to +199	131	11	85	7	187	16
+200 to +299	59	5	23	2	57	5
+300 to +399	19	2	11	1	47	4
+400 to +499	9	<1	9	<1	18	2
+500 to +999	24	2	11	1	37	3
+1,000 to +1,999	6	<1	8	<1	16	1
+2,000 to +2,999	2	<1	1	<1	4	<1
+3,000 to +3,999	2	<1	..	..	3	<1
+4,000 to +4,999	..	..	1	<1	1	<1
+5,000 to +5,999	1	<1	..	..	1	<1
+6,000 to +6,999	..	..	..	..	1	<1
Total number of samples	1,164		1,164		1,164	
Number showing increase	866	75	698	60	943	81
Number showing decrease	176	15	316	27	120	10
Number showing no difference	122	10	150	13	101	9
Average percentage increase or decrease		+37		—7		+59

<i>B.—1,071 Samples of Grade A Pasteurized Milk</i>						
—50 to —100	33	3	90	8	34	3
—6 to —49	95	9	216	20	66	6
No difference	57	5	112	10	57	5
+6 to +49	197	18	266	25	141	13
+50 to +99	187	17	166	15	135	13
+100 to +199	220	21	109	10	208	19
+200 to +299	86	8	49	5	117	11
+300 to +399	57	5	21	2	68	6
+400 to +499	53	5	13	1	47	4
+500 to +999	56	5	16	2	124	12
+1,000 to +1,999	20	2	8	<1	51	5
+2,000 to +2,999	6	<1	4	<1	14	1
+3,000 to +3,999	4	<1	..	..	3	<1
+4,000 to +4,999	..	..	..	..	4	<1
+5,000 to +5,999	..	..	..	..	1	<1
+6,000 to +6,999	..	..	1	<1	..	..
+8,000 to +8,999	..	..	..	..	1	..
Total number of samples	1,071		1,071		1,071	
Number showing increase	866	83	653	62	914	86
Number showing decrease	128	12	306	28	100	9
Number showing no difference	57	5	112	10	57	5
Average percentage increase		+72		+46		+120

* Standard nutrient agar.

† Original formula of Bowers and Hucker containing 5 gm. tryptone, 1 gm. of glucose, 5 ml. of skim milk and 15 gm. of agar per liter. The dehydrated tryptone-glucose medium was supplied by Difco Laboratories, Inc.

for 1,164 samples of raw milk; +72, +46, and +120 per cent for 1,071 samples of Grade A pasteurized milk; +86, +52, and +191 per cent for 866

samples of Grade B pasteurized milk; +195, +56, and +245 per cent for 1,147 samples of pasteurized cream. As pointed out by Kelly,⁹ the average

TABLE II (Cont.)

Distribution of Percentages of Increases or Decreases in Counts by the Modified Methods as Compared to the Standard Method in the Case of 4,248 Samples of Milk and Cream Studied by 17 Milk Companies in 10 States

Percentage Increase or Decrease in Counts	S. A.*—32° C.		T. G. M.†—37° C.		T. G. M.†—32° C.	
	Number of Cases	Per cent	Number of Cases	Per cent	Number of Cases	Per cent
<i>C.—866 Samples of Grade B Pasteurized Milk</i>						
—50 to —100	8	1	35	4	8	1
—6 to —49	33	4	166	19	32	4
No difference	51	6	76	9	36	4
+6 to +49	157	18	219	25	111	13
+50 to +99	175	20	142	16	101	12
+100 to +199	204	24	97	11	158	18
+200 to +299	90	10	41	5	113	13
+300 to +399	65	8	27	3	86	10
+400 to +499	29	3	11	1	44	5
+500 to +999	38	4	39	5	108	12
+1,000 to +1,999	15	2	9	1	48	6
+2,000 to +2,999	1	<1	3	<1	15	2
+3,000 to +3,999	..	..	1	<1	2	<1
+4,000 to +4,999	..	..	..	..	1	<1
+5,000 to +5,999	..	..	..	..	1	<1
+6,000 to +6,999	..	..	..	..	1	<1
+7,000 to +7,999	..	..	..	..	1	<1
Total number of samples	866		866		866	
Number showing increase	744	89	589	68	790	91
Number showing decrease	41	5	201	23	40	5
Number showing no difference	51	6	76	9	36	4
Average percentage increase		+86		+52		+191
<i>D.—1,147 Samples of Pasteurized Cream</i>						
—50 to —100	34	3	31	3	25	2
—6 to —49	79	7	131	11	55	5
No difference	69	6	79	7	50	4
+6 to +49	241	21	243	21	129	11
+50 to +99	168	15	179	16	125	11
+100 to +199	218	19	168	15	172	15
+200 to +299	98	9	100	9	117	10
+300 to +399	65	6	46	4	87	8
+400 to +499	32	3	29	3	61	5
+500 to +999	67	6	70	6	147	13
+1,000 to +1,999	33	3	39	3	95	8
+2,000 to +2,999	9	1	12	1	27	2
+3,000 to +3,999	8	1	8	1	12	1
+4,000 to +4,999	6	1	3	<1	11	1
+5,000 to +5,999	1	<1	..	..	2	<1
+6,000 to +6,999	..	..	2	<1	2	<1
+7,000 to +7,999	2	<1	2	<1	6	1
+8,000 to +8,999	1	<1	..	..	3	<1
+9,000 to +9,999	3	<1	1	<1	4	<1
+10,000 to +19,999	8	<1	2	<1	9	1
+20,000 to +29,999	1	<1	2	<1	1	<1
+30,000 to +39,999	..	..	..	..	1	<1
+40,000 to +49,999	1	<1	..	..	1	<1
+50,000 to +59,999	..	..	..	..	2	<1
+60,000 to +69,999	..	..	..	..	2	<1
+80,000 to +89,999	1	<1	..	..	1	<1
+110,000 to +119,999	1	<1	..	..	..	..
Over 1,000,000	1	<1	..	..	..	..
Total number of samples	1,147		1,147		1,147	
Number showing increase	965	84	906	79	1,017	89
Number showing decrease	113	10	162	14	80	7
Number showing no difference	69	6	79	7	50	4
Average percentage increase		+195		+56		+245

* Standard nutrient agar.

† Original formula of Bowers and Hucker containing 5 gm. tryptone, 1 gm. of glucose, 5 ml. of skim milk and 15 gm. of agar per liter. The dehydrated tryptone-glucose medium was supplied by Difco Laboratories, Inc.

decrease of —7 per cent in the case of the raw milk samples and the modified medium is misleading since it was due to a single sample. If the one sample is omitted, an average increase of 56 per cent is obtained. This affords an excellent example of the limitations of arithmetical averages.

In the second place, the increase in count due to modified methods is least in raw milk and progressively greater in Grade A pasteurized milk, Grade B pasteurized milk, and greatest of all in pasteurized cream, as illustrated by average percentage increases in count on tryptone agar with 32° C. incubation of 59 per cent in raw milk, 120 per cent in Grade A pasteurized milk, 191 per cent in Grade B pasteurized milk, and 245 per cent in pasteurized cream.

The third important point is that the use of modified methods does not merely result in a constant percentage increase in count. Many persons have not realized this and have opposed change in methods on the ground that there is no advantage in change if it merely results in a constant increase in count. While analysis of data by arithmetical averages may tend to convey this impression, analysis by frequency distributions (Table II) shows wide distribution in the range of decreases and increases. This indicates that the average percentage increase in the case of the modified methods is relatively uncommon.

SUMMARY AND CONCLUSIONS

The study of about 24,000 samples of dairy products by 56 laboratories shows conclusively that modified methods produce a greater spread between counts of truly good quality and truly poor quality products than does the present standard method. The numerical increase in count is slight in the case of truly high quality products.

At the present time, there is considerable lack of confidence in standard agar plate counts and a trend away from their use. Adoption of a better standard medium and a lower incubation temperature should do much to restore confidence in colony counts because of the better correlation between results obtained by inspectors and laboratory workers than is the case at the present time.

NOTE: Grateful acknowledgment is made to the many persons who assisted in the collection of the data which made this report possible.

REFERENCES

1. Bowers, C. S., and Hucker, G. J. The Composition of Media for the Bacteriological Analysis of Milk. *New York Agri. Exper. Sta. Tech. Bull.* No. 228, 1935.
2. McCrady, Mac. H., and Archambault, Jacques. Discussion of Paper by Bowers and Hucker. *A.J.P.H.*, 26, 4:352, 1936.
3. Safford, C. E., and Stark, C. N. Further Studies on Skimmilk Agar for Routine Milk Counts. *J. Dairy Sci.*, 20:577, 1937.
4. Demeter, K. J., and Löweneck, M. Zur Vereinheitlichung des Plattenverfahrens bei der Milchkeimzahlbestimmung (Art des Nährbodens). *Milchwirtsch. Fortsch.*, 3, 18:131-149, 1936.
5. Bradfield, A. Bacterial Content of Milk as Affected by the Use of Different Plating Methods. *Vermont Sta. Bull.* No. 417, 1937.
6. Frayer, J. M. A Statistical Comparison of Two Methods for Determining the Bacterial Count of Milk. *Vermont Bull.* No. 423, 1937.
7. Dennis, J. Drexel, and Weiser, Harry H. Comparative Studies on Bacterial Milk Counts in Various Types of Media Incubated at 20°, 30° and 37° C. *J. Dairy Sci.*, 20:445, 1937.
8. Phelan, Joseph F. Some Effects of the Proposed New Bacteriological Techniques. *J. Dairy Sci.*, 19:385, 1936; *The Milk Inspector*, 5:15.
9. Kelly, Ernest. Report of Collaborator on Co-operative Work With Proposed Changes in Medium and Temperature of Incubation. *Lab. Sect. Internat. Assoc. Milk Dealers*, 29th Ann. Proc., 1936, p. 50.
10. Curtis, L. R., and Hileman, J. L. A Comparison of Media and Incubation Temperatures for Making Bacteria Counts of Spray-Process Dry Skim Milk. *Food Res.*, 2, 1:73, 1937.
11. Babel, F. J. Significance of Laboratory Tests in the Control of Ice Cream. *Ice Cream Trade J.*, 32, 9:35, 1936.
12. Robertson, A. H. The New Proposed Procedure for Making Ice Cream Plate Counts. 36th Ann. Proc. Prod. & Lab. Council, Int. Assoc. Ice Cream Mfrs., 2:132, 1936.
13. Yale, M. W., and Hickey, R. C. The Effect of Using Tryptone-Glucose-Skim Milk Agar and 32° C. Incubation on the Bacterial Colony Count of Ice Cream. *J. Dairy Sci.*, 20:755, 1937.
14. Yale, M. W., and Pederson, Carl S. Optimum Temperature of Incubation for Standard Methods of Milk Analysis as Influenced by the Medium. *A.J.P.H.*, 26:344, 1936.

Syphilis Control in Industry*

R. R. SAYERS, M.D., F.A.P.H.A.

Senior Surgeon, Division of Industrial Hygiene, National Institute of Health, Washington, D. C.

AT the turn of the century we were ignorant of the essential problems in the control of syphilis. In 1905 Schaudinn discovered the organism; in 1907 the researches of Bordet and Wassermann gave us the complement-fixation test; in 1910 Ehrlich performed his 606th experiment of a series and gave us salvarsan. In the short space of 6 years the new methods for diagnosing and treating syphilis were created.

Surgeon General Parran has pointed out that the first large scale experiment in the use of these weapons was an industrial experiment. It was war time. America's biggest industry—the war industry—was hiring more than five million military employees. An army needs health, and the new instruments against syphilis were used in a demonstration of military medicine that at the close of hostilities became also a popular campaign. That campaign unfortunately was abortive. As Dr. Parran pointedly suggested in his recent address before the American Medical Association, "We apparently thought that the spirochete was demobilized with the army."

In the years since that time the technic of the darkfield has been im-

proved; the complement-fixation has been refined; and the sensitive flocculation tests have added to the accuracy of diagnosis. Within the past half dozen years the Coöperative Clinical Group Studies have given to the treatment of syphilis a precision which it did not have before. During the last 18 months the taboo has been broken. Syphilis is now discussed publicly.

Thus we have medical weapons in a highly perfected state. We have public acceptance and support. The next question is: Is the campaign against syphilis going to be a nine days' wonder, another thing that "something ought to be done about," or will it be translated into definite programs?

Medical historians will judge the fight on syphilis by its results. Those results can be measured only in terms of how many patients come to treatment, how many patients who come to treatment get adequate treatment, and how well also the existing medical facilities contribute to those results.

In this fight public health authorities can expect the coöperation of industrial medical services. Letting syphilis go on is bad economics; industry is alive to economics. Syphilis is a killer, as the Surgeon General has declared. More than 1,000,000 years of life expectancy is lost each year to syphilitic deaths. Syphilis as the cause of aneurysm, paresis, tabes dorsalis, and cardiovascular disease, is a threat to the efficiency and safety which are funda-

* Read at a Joint Session of the National Society for the Prevention of Blindness and the Industrial Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

mental in the industrial processes. Syphilis, through these diseases, costs America in institutional care between 40 and 50 million dollars every year. Both as a taxpayer and as an employer, industry is interested in all these phases of syphilis. There is no sum which has been suggested for control which approaches the present cost of syphilis to American communities. It has been well said that "the cheapest thing America can do with her million annual cases of syphilis is to cure them."

Some companies, but proportionately not many, have taken steps to meet this problem of syphilis. In the Division of Industrial Hygiene we recently directed letters to more than 200 industrial surgeons. To quote the summary of those studies as presented in the Surgeon General's book, *Shadow on the Land: Syphilis*:

Of 80 companies employing nearly a million persons, only 15 make routine blood tests as part of the preemployment and later periodic examinations. Among a total of 110,675 employees reexamined, 5,313, or 4.8 per cent, were positive. Among a smaller number of applicants (21,239) 2.3 per cent were positive, indicating that those who know they have syphilis seek employment where no tests are made.

The proportion of the amount of testing done among the railroads is somewhat larger. Fifteen railroads, employing 414,684 of America's million railroad workers, reported that they had examined 119,535 of their employees. Some roads reported that virtually all of their employees had been tested. One railroad reported that it had tested 45,000 employees; another reported 20,000 employees tested, another 16,000, and another 8,000. This interest on the part of the railroads goes back for 15 years. More than 10 years ago the railroad surgeons drew up a recommended program for venereal disease control. Their interest stems in large measure from the importance of the safety factor in railroading.

There are two questions involved in the approach of industry to syphilis. The first is the general question of policy. Should blood tests be given? What should industry do to reduce the incidence of syphilis among its workers? What in general should be its attitude toward the employee with a positive Wassermann? The Surgeon General, in his address before the Medical and Surgical Section of the American Railway Association last June, and in an article he published in the September issue of *Factory*, a management magazine, summarized this problem in suggesting:

1. That routine blood tests are desirable for applicants for employment.
2. That routine blood tests are desirable at the time of periodic reexamination of employees.
3. That industry with its compact organization will find the development of a vigorous educational program profitable.
4. That industry might extend that educational campaign into the field of prophylaxis.
5. That there is a responsibility upon the industrial medical officer to see that adequate modern treatment is available to employees at prices ordinary wage earners can afford—that if such is not available in private practice or at public clinics, the industrial medical service should itself undertake such treatment.
6. That syphilis must at all times be handled as merely another communicable disease. The privacy of relations between the worker and the medical service should be conducted in the best professional tradition. In ordinary cases it cannot be regarded as ground for the rejection of applicants or for the dismissal of employees, though treatment may be properly required.

The other principal problem is that of applying this general policy to particular workers and in particular types of jobs. What should industry do about the machinist with syphilis, the crane operator with syphilis, the waitress with syphilis, the plant manager with syphilis, and the chairman of the board of directors with syphilis?

One need not search far to conclude that the policies now applied are often hit or miss. I have in mind the policy

followed until a short time ago by the Civil Service Commission of the United States. It did not ask routine blood tests for syphilis from prospective employees. When, however, the fact was discovered that a prospective employee was infected, he was rejected out-of-hand. Expressions of deep solicitude for the retirement funds were made to explain the policy. A real interest in the retirement funds would have suggested that a policy of routine blood tests, plus the requirement of treatment, but without the policy of discharge, would be far more intelligent.

Or take this case from industry: Some months ago a young man applied for a job in an eastern air craft engine factory. His qualifications as a machinist were found to be high. He was hired. After a week's work he was given a physical examination, which included, as all good physical examinations should, a blood test. His blood test was positive. He was fired.

A few days later he became the patient of a prominent eastern syphilologist. He gave a history of having had a primary chancre some years before. The doctor that he consulted treated it with a "powder," probably calomel. When the secondary rash appeared, he had been advised to take baths in a solution of baking powder. This also had disappeared. Until the time of the blood test he had no knowledge of the true nature of his disease. It may be fairly said that his condition was due to the negligence or ignorance of the "physician" who originally saw his case.

This patient was willing to take treatment, eager to do so. His inability to secure a job, however, jeopardized his ability to pay for such treatment.

The syphilologist protested to the company. He pointed out that in that stage of the disease treatment was a definite bar to central nervous system

complications and a definite protection from infection. The cure was almost certain. He offered to report from time to time on the progress of treatment. At the time the last correspondence relating to the case came to the Public Health Service the syphilologist had not received any reply from the company.

I need hardly say from the point of view of modern medical science that the syphilologist was right; the company was wrong. There was no element of risk involved in this case. By way of contrast it might be worth while to note that in the routine physical examination given to commercial pilots who fly the planes that use the motors that were built in the plant, who have the lives of passengers and the safety of expensive equipment in their hands, the blood test is not included. Yet *only* the blood test can reveal syphilis in the latent stage.

Or take another case from real life: The wife of a member of our staff was riding home in a nearly empty bus one evening when a talkative lady sitting next to her began to discuss the awful case of her maid. The girl, it seems, had been too insistent about her Thursday afternoons off. She had let slip the fact that she was going to her doctor and the scandalized housewife discovered that she had been under treatment for syphilis for nearly a year. The housewife, being highly moral and very timid, fired the maid.

Now obviously, the lady was not one who was systematic enough to ask a routine blood test in advance. Obviously, too, the maid belonged to that small fraction of syphilitics tenacious enough to continue treatment over an extended period. She was non-infectious and of no danger to anyone; in fact she was far safer than many whose blood test showed negative a week or so before.

This, though not a case of industrial

employment, is nevertheless typical of many management decisions with regard to syphilis. It is not dissimilar to the policy of the Civil Service Commission, as cited. Each of you can probably recall a dozen or more similar cases from your own experience.

These cases are worth citing because they emphasize the need for a careful consideration of syphilis and the job. One can lay down broad policies, but he must exercise administrative judgment within the ambit of those policies in terms of two variables: (1) the particular job, its requirements and responsibilities; (2) the particular syphilitic, the stage of the disease and the treatment taken.

When one considers the job there seem to be four principal sorts of human relationships involved. Three of these concern industry—the other, the individual job, is more or less distinguished by the fact that it is not integrated into a larger enterprise, the job of the farmer, the artist, or the prospector, for example.

The most obvious concern when one considers syphilis is the *personal contact job*. This group would include the food handlers, the hotel help, barbers, beauty parlor workers, Pullman porters, matrons, nurses, school teachers, and all whose work brings them into intimate personal relations with other people. It is these that present the greatest possibility of chance infection.

Considered in terms of the various stages of the disease, it is the early stage that is of most importance. The latent syphilitic is not likely to transmit an accidental infection. A parietic cook may spoil one evening's broth, but he is not apt to pass his syphilis on to anyone else. But the primary and secondary stages, when chancres, skin rashes, or mucous patches appear, are important. Anyone who has responsibility for this group of workers must keep high his index of suspicion when-

ever a skin lesion of any kind appears. The darkfield should be freely employed to discover the early cases in that 10 to 20 day period of the first chancre, before the blood turns positive.

The second job group in which syphilis is of importance to industry is the *job of responsibility*. The air pilot or the engineer, responsible for the safety of passengers, the operator of switches or interlocking systems, the train dispatcher, the crane operator, the executive with his financial responsibility for the management and finances of the enterprise, all would fall within a group which presents no extraordinary opportunity for accidental infection, but in which mental or physical failure under stress may have disastrous consequence to the safety of their fellow workers, the public, themselves, the equipment, or even the company.

Among various stages of the disease the first stage has only its public health importance. It is the latent stage and the incipient later stages which concern us. The need of periodic blood tests, of insistence on treatment which will arrest the disease before it enters the central nervous system or threatens an internal organ with aneurysm, is evident. Only the blood test will find syphilis at this stage. You are dealing, moreover, with an extremely valuable group of employees. These complications come in late middle life. The longer their seniority and training the more valuable they are likely to be; the higher they have risen in rank and leadership the sounder is the industrial policy which makes their cure a responsibility of industry.

There is another sort of job group, which I might call, for want of a better term, the *routine job*. Here will fall many of the operators of individual machines, janitors, helpers, and clerks. They present on the one hand no unusual problem of chance infection; on the other hand no physical or men-

tal failure would have large consequences to the work, their fellows, or patrons of the company.

This group of workers presents a problem which is present with the two classes mentioned before. I did not emphasize this because hazards of infection and safety were dominant considerations. If they have syphilis they are sick men. That fact must not be obscured by the fact that they are not bedridden. If they have early syphilis they have an infectious skin lesion which may be passed either venereally or by chance contact to others and will almost certainly be passed to their wives and children. If they have latent syphilis, however complete the apparent peace they have made with the spirochete, there are statements to indicate that they are not the efficient employees they would be without latent syphilis. It is true that there are no accident statistics to cover this point. One can find countless cases to illustrate the slow healing of wounds or bone structure in the case of syphilitics. One can find compensation claims paid for injuries which better medical advice would have set down to syphilitic infection rather than accident. How large this sort of thing bulks in the annual budget of a large industrial organization may be a matter of dispute. It is certain, however, that half a dozen such cases a year would bulk much larger than the cost of a company program for the control of syphilis.

Let us not forget this as we discuss the hazards of syphilis: There is a silver lining to the problem. Treatment is specific, certain in results. It is long, but no other serious disease yields so definitely to the physician. All these hazards are unnecessary if syphilis is found through routine blood tests, if treatment is available and adequate.

Two years ago an advisory committee to the U. S. Public Health

Service was formed to consider the establishment of State and Local Programs for Venereal Disease Control. It included health officials, leading syphilologists. They sifted the experience of Sweden, Denmark, Great Britain, and leading states and cities of this country. They drafted a program which would serve as a blue print for states and municipalities which were setting up public health facilities against syphilis. From Social Security funds, \$8,000,000 had been set aside for public health activities. With new funds available states which had allowed venereal disease control to atrophy were rehabilitating their programs.

That program recommended among other things, free laboratory service available to physicians and private medical services throughout the state. It should be possible, in any state with a well organized program, for companies, such as those many of you represent, to send your blood or dark-field specimens to a central state laboratory for analysis and report.

Such facilities are not yet universal. Where such state laboratories exist they sometimes refuse to perform tests on the large scale required by industrial concerns. There are two answers which may be given: The service is an integral part of the state's program of venereal disease control. It is one which you may properly insist on, using every appropriate resource of pressure to secure it. On the other hand, with the great growth of interest in venereal disease control, many state laboratories cannot expand their facilities rapidly enough to meet these needs. If satisfactory contract arrangements cannot be made with private laboratories, the cheapest way to secure performance of these blood tests would be the hiring of a technician to perform them in your own laboratory. It is work which would not, after the

first few weeks, take the full time of the technician. There are, I believe, few medical staffs that could not make effective use of an additional laboratory person of this type.

This is the solution to the problem applied by Dr. G. H. Gehrmann in Dupont's outstanding program of syphilis control. Tests were done by the company laboratory. Positive results were checked by second specimens and tests. If no definite history of the disease was found, positive tests were double checked by work in independent laboratories.

In Dr. Gehrman's original program the men were then directed to consult their private physicians. The latter were supplied the necessary information with reference to the patient. But Dr. Gehrmann's experience with private treatment of syphilis was not always good. As some clue to what you yourselves may find—perhaps you have already found it—I will quote his own comments on the work. He says:

Each case has been followed persistently by the staff of the medical division to insure continuous treatment, and it is through this follow-up of employees who have been referred to their own physicians for treatment that so much has been learned of the difficulties which make the present plan of handling these cases seem unsatisfactory:

The findings are enumerated:

1. Very few refuse to take their treatment.
2. Most physicians demand prices for treatment that are beyond the means of the individuals and out of reasonable proportion to their incomes. Some physicians maintain these high prices despite the fact that they are receiving arsphenamine, neoarsphenamine, and bismuth free of cost from their state.
3. Many physicians refuse to treat the referred cases, stating that no treatment is indicated, in spite of four plus Kahn and Wassermann reactions although the cases have never received adequate treatment.
4. Numerous physicians refuse to admit that their patients have syphilis (again in the face of four plus Kahn and Wassermann reactions). This group denies the validity of blood tests and states that they have known their patients for years, and further know

that these same patients could not have contracted syphilis without their (the doctors') knowledge.

5. On several occasions the attending physician has sent a blood specimen to a private or state laboratory and the report has come back that the reaction is negative. In every instance the results obtained by the company laboratory have been corroborated by subsequent check, but the attending physician has not always admitted that the patient has syphilis.

6. Many cases are discharged as having had sufficient treatment, after 3 to 10 injections of neoarsphenamine without a heavy metal.

7. Some have been reported as being well after a few mercury inunctions or a few intramuscular injections of water-soluble bismuth.

8. Some are being treated with pills and nothing else.

9. Treatment at the free clinics is very satisfactory but it is not always possible for employees to conform to clinic hours and in some places the clinics refuse to treat any patient who is employed.

The evidence (he refers here to the entire report) presented above indicates that the incidence of syphilis in industry is of sufficient extent to be well worth consideration both from the standpoint of public health and industrial risk. The problem of getting these cases adequately treated is extremely difficult, and the question arises, is it advisable for industry to assume the entire obligation of treating these cases?

There is no question but that this work is well worth while, and there is no question about the adequacy of the treatment which the majority of these infected employees receive. But it does seem advisable for the industry to take over the entire management of these patients and thus insure to them continuous and proper treatment.

At some of the Dupont plants Dr. Gehrmann has since instituted the policy of treating employees suffering from syphilis. His reports would indicate the wisdom of the policy.

I would like to revert in conclusion to what industry may *expect* from state and local public health administrations. I need not discuss the administrative problems of the state and local health officers in detail. The details of these problems are their responsibilities, but there are some phases of syphilis con-

trol which the industrial medical service finds it difficult to handle by itself. Where did the employee with syphilis acquire his syphilis? How shall that source of infection be prevented from infecting others? The responsibility of finding the source of infection and eliminating it before the disease is spread to others is largely a job for the public health authorities, and the industrial medical officer should expect and receive vigorous coöperation in such case finding. Most public health officials will be glad to coöperate in bringing to treatment infected members of the syphilitic's family or those who do not have access to industrial medical care programs.

I need hardly reiterate that the industrial surgeon should expect and receive effective, expert consultation on the problems of control. The industrial medical officer is contributing one of the most effective possible medical units to the public health battalions against

syphilis. He should expect, before long, that adequate facilities be available in every state for his serologic tests. He should receive, along with every other physician, free anti-syphilitic drugs as part of the state program.

Where the industrial medical official does not receive this kind of coöperation, he should state his case clearly to his own management, to his medical organization, and to associations of business men who are coming increasingly to an understanding of this problem. With these as his allies, he should be able to secure action. He will find, in most cases where the health official has not coöperated, that it is a lack of administrative authority under the law or lack of funds that has made it impossible to coöperate effectively. Health officials will, I am sure, welcome such allies in educating legislators and the public to the problems of syphilis control.

Score Cards for Eating Places

SCORE cards for restaurants and other places serving food to the public will be issued by the Washington (D. C.) Department of Health. Establishments will be scored on the basis of rigid inspections of the premises, as well as bacterial determination in utensils, and other checks, one of which is health status of employees. No establishment will be given 100 per cent on the score card without a physician's certificate of health for each

employee. Other checks include: serving of milk in original bottles; posting food signs; obtaining oysters from certified sources; discarding cracked china; and eliminating silver polishes containing cyanide. Records of illnesses among employees must be given to inspectors, including proof that proper medical approval has been given before an employee is allowed to return to work after illness.—*The Health Officer*, U.S.P.H.S., Dec., 1937.

Comparative Methods of Diagnosis of Rabies in Animals*

CHARLES N. LEACH, M.D.

Field Director, Rockefeller Foundation, State Board of Health, Montgomery, Ala.

NEGRI announced his microscopic test for rabies in 1903 which has since been generally followed in routine diagnostic work. A considerable amount of investigation concerning the pathological changes in the central nervous system had already been published. As early as 1892 Babes¹ described his "rabid tubercles." Ganglionic changes occurring in the disease were described by van Gehuchten and Nélis,² and McCarthy and Ravenel.³

Following the announcement of Negri's discovery earlier microscopic methods of diagnosis were gradually succeeded by the Negri body test. It is known that Negri bodies are not always demonstrable in the brains of rabid animals. Joseph Koch⁴ states that 10 to 12 per cent of the brains which are positive on animal inoculation will fail to show Negri bodies when the customary method of examination is employed. This percentage of error, he claims, would be reduced if impressions or smears were taken from ganglion cells and various parts of the brain instead of from the Ammon's

horn alone. The percentage of error will probably vary also with the prevalence of the disease in the geographical areas from which the material for diagnosis is obtained. In regions of high endemicity one might expect a high percentage of Negri negative specimens proving positive on animal inoculation.

Negri found peculiar intracellular bodies occurring with a high degree of constancy in different parts of the central nervous system, especially in the Ammon's horn of the hippocampus major or in the Purkinje cells of the cerebellum. These bodies exhibit marked variations in size; the diameter varying from 1 μ to 27 μ . In form they may be round, oval, or, in the larger bodies, pear shaped. The internal structure is reticulate and usually contains one or more vacuoles. The bodies are surrounded by a clearly defined membrane.

The injection of brain emulsion from rabid animals into rabbits and guinea pigs is uncertain in its results after incubation periods of 2 to 8 weeks. In consequence of the long incubation period and uncertainty of infectivity in these animals, their use has been very limited in recent years.

Mice have been tried as test animals by European workers, but have not proved satisfactory. Babes⁵ in 1887

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

The studies and observations herein reported were conducted with the support and under the auspices of the International Health Division of the Rockefeller Foundation and the Alabama State Board of Health.

reported that they were susceptible to rabies. He stated that they develop the furious type of the disease and that great care should be exercised in handling the animals during the late stages of the disease because of the danger of being bitten. Gerlach⁶ reports a series of 26 white mice injected with street virus from Negri positive brains, only 17 of which died of rabies. He does not state how the injections were administered and does not recommend the white mouse as a test animal.

A questionnaire was sent to all state laboratories in the United States asking if confirmatory animal inoculations were employed with Negri negative material. Replies were received from 39 states, and 5 reported that all Negri negative material was being injected into rabbits or guinea pigs. Five laboratories stated that they occasionally checked their Negri negative material by animal inoculation. Among the above 10 states employing animal inoculation for the diagnosis of rabies, 5 listed the guinea pig as the animal of choice and 4 the rabbit, while one laboratory uses the guinea pig and rabbit on each specimen examined. The reasons given for not employing the confirmatory animal test included the following: (1) delay in obtaining a result, (2) inadequate facilities for housing animals, (3) cost of laboratory animals.

Webster and Dawson⁷ have described an improved method of diagnosis by mouse inoculation. They make use of a special strain of white mice supposedly bred for special susceptibility to neurotropic viruses. Four to 6 weeks old white mice are highly susceptible to the rabies virus when inoculated intracerebrally with brain emulsion from a rabid animal. The mouse technic as practised in this laboratory is as follows:

Material, when not examined fresh, is preserved in full strength glycerin. A

small portion of the Ammon's horn is ground up in a sterile mortar and 9 parts of hormone broth added to 1 part of ground brain material. This is thoroughly emulsified and then centrifuged at 2,000 to 2,500 revolutions per minute for about 5 minutes. With a 0.25 c.c. tuberculin syringe, 0.03 c.c. of the supernatant fluid is injected into the brain through the skull of a 4 to 6 weeks old mouse. A 27 gauge needle, $\frac{1}{4}$ " long is employed, and the injection made slightly to one side of the mid line of the skull and half way between the eye and ear. The site of inoculation is moistened with alcohol before injecting. The mice are lightly etherized before the operation. It has been our practice to inoculate 4 mice with each brain specimen. When the injections are performed by experienced technicians, one can expect a mortality of 0.5 to 1.0 per cent due to mechanical injury. In our series of 1,032 brain specimens we have employed 5,339 mice with a mortality of 1.7 per cent due to mechanical injury. This is higher than usual and may be explained by the fact that many of the injections were performed by persons learning the technic.

Table I gives an analysis of the findings on 1,032 specimens from various animal brains received from Alabama, Georgia, West Virginia, Connecticut, and Havana, Cuba. Of the total received, 338 specimens were reported positive by the diagnostic laboratories, 690 negative, and 4 questionable. Among the 338 specimens reported positive for Negri bodies, 3 proved negative on mouse inoculation; 83 of the 690 reported negative (12.0 per cent) produced typical symptoms of paralytic rabies in the mouse, and Negri bodies were demonstrated in the mouse brain. Three of the 4 specimens reported as questionable by the diagnostic laboratories proved positive on intracerebral mouse inoculation. ✓

TABLE I

Comparative Diagnostic Results by the Usual Laboratory Methods and the Mouse Inoculation Technic

Animal	Number Examined	Reported +		Reported -		Per cent Reported		Reported	
		Found	Found	Found	Found	Found	Found	Questionable	Found
Dogs	815	507	3	506	67	13.2%		2	1
Cats	135	14	0	120	5	4.2%		1	1
Cows	44	12	0	31	4	12.9%		1	1
Hogs	12	1	0	11	3	27.3%		0	0
Mules	11	1	0	10	1	10.0%		0	0
Human	4	1	0	3	2	66.7%		0	0
Foxes	3	1	0	2	0	0.0		0	0
Horses	3	1	0	2	1	50.0		0	0
Chickens	2	0	0	2	0	0.0		0	0
Rat	1	0	0	1	0	0.0		0	0
Squirrel	1	0	0	1	0	0.0		0	0
Goat	1	0	0	1	0	0.0		0	0
Totals	1,032	538	3	690	83	12.0%		4	3

In an effort to determine the relative susceptibility of the true field mouse (*Peromyscus polionotus polionotus*—Wagner) and the Webster-Dawson strain of white mouse, a group of white mice and field mice were injected with brain emulsion from 11 different animals. The same supernatant fluid from each specimen was injected at the same time into mice of the two groups.

Table II shows a slightly greater resistance to the rabies virus on the part of the field mice. This may be due in part to the fact that some of the field mice were well over 6 weeks of age, as could be determined by the ossification of the skull. The needle was forced through some of the skulls of field mice with greater difficulty than was the case with the younger white mice of known age. The field mice were much more excitable and difficult to handle, and in some cases the furious type of rabies was produced, whereas among the 5,339 white mice inoculated, none has shown the furious type.

When the disease appears among a group of inoculated mice, in the great

majority of instances all mice in the group succumb. One survivor has been observed from each of 4 groups, and in 3 groups there were 2 survivors in each of 4 inoculated. The survivors may show early symptoms and later recover, but no recoveries are recorded after the disease reaches the paralytic stage.

After the development of paralysis, death follows on an average of approximately 48 hours. Sluggishness, roughening of the fur and loss of hair luster appear as the earliest symptoms, followed by photophobia in many cases and a conjunctivitis with sero-purulent discharge. Paralysis, most frequently of the hind legs, appears and the legs are extended either to the sides or straight back. At this stage convulsions are frequently seen, especially when the animal is disturbed by jarring or noise. Death is preceded by complete prostration and labored and irregular respiration. Of the 2,095 mice injected with rabies positive brain material, the majority died in from 10 to 12 days.

An occasional mouse inoculated intracerebrally with brain emulsion from a

TABLE II

*Comparative Susceptibility of the Field Mouse and the Webster-Dawson Strain of White Mouse

SPEC NO	MOUSE	MORTALITY AFTER INJECTION (IN DAYS)																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
510	White						I ⁺				II	III											
	Field						I ⁺	I ⁺					I ⁺			III							
511	White	I					I ⁺		I ⁺		II			I									
	Field				I		I ⁺							II ⁺		I	I						
513	White						I ⁺				I	I	II	I									
	Field	II									I			II ⁺	I	I							
514	White						I ⁺				I	II	I	I									
	Field	I					I ⁺						II				I	I	I				
897	White										I ⁺			I			III		I				
	Field	I									I ⁺								I	I	I		I
915	White								III ⁺	III ⁺													
	Field	I							I ⁺			II				II							
932	White							I	II ⁺		I	II											
	Field	II		II					I ⁺					I									
933	White						III ⁺	I	I														
	Field						II ⁺		III					I									
937	White						III ⁺	I ⁺															
	Field						I ⁺		II		I		II										
948	White						I ⁺	II	II					I									
	Field						I ⁺		I	I	I				II								
971	White							I	II ⁺	I	I	I											
	Field	I							I ⁺			I	I	I									

| + Indicates mouse sacrificed and found Negri +

| - Indicates mouse sacrificed and found Negri -

positive case showed Negri bodies as early as the 5th day after injection. On the 6th day following intracerebral inoculation with Negri positive brain, 226 of 289 (78.2 per cent) mice examined were Negri positive and 3 doubtful✓

It has been the experience of this laboratory that in brain material from animals vaccinated against or treated for rabies, Negri bodies are more difficult to demonstrate in the original material. The disease, however, can be produced in mice, with the production of Negri bodies, by inoculating with material from the brain✓

A human brain from an adult dying of rabies following a face bite inflicted by a proven rabid dog was submitted for examination. This patient started treatment the day following the bite and received 3 injections a day for 15 days. The patient developed rabies 21 days after exposure, and the brain was found negative for Negri bodies on repeated examinations. Mouse inoculation with this material proved positive, and Negri bodies were present in the mouse brain on the tenth day after intracerebral injection. When a vaccinated dog develops the disease, it is usually of the paralytic or "dumb"

type, and the experienced veterinarian's diagnosis is of the utmost importance, as the Negri diagnosis is unreliable. In these cases the intracerebral injection is of particular value.

The mouse test offers a cheaper and more rapid method of diagnosis than is the case with the guinea pig or rabbit. Mice purchased from dealers cost 15 cents each but can be bred with little difficulty, thus reducing the cost. Reactions to rabies virus when injected intracerebrally into the mouse are very consistent and offer a reliable means of verifying the routine microscopic Negri technic.

SUMMARY

A technic for the earlier diagnosis of rabies by mouse inoculation is described. In addition to shortening the period required for animal diagnosis the method has the advantage of consider-

ably reducing the cost. Comparative results from brain material of 1,032 animals diagnosed by the usual methods in several laboratories and then injected into mice confirmed the positive results obtained by the usual methods, but disclosed an error of 12.0 per cent for the brains reported negative for Negri bodies.

The vaccination or treatment of animals with rabies vaccine apparently increases the difficulty of diagnosis by the discovery of Negri bodies.

REFERENCES

1. Babes. *Ann. de l'Inst. Pasteur*, 1892.
2. van Gehuchten and Nélis. *Presse Med.*, 1900.
3. McCarthy and Ravenel. *J.A.M.A.*, XL:753, 1903.
4. Koche, J. Kolle-Krause-Ulenhuth. *Handbuch der Path. Mikroorg.*, XI:669, 1929.
5. Babes. *Virchow Arch. f. path. Anat.*, 1887, Bd. 110.
6. Kraus, Gerlach and Schweinburg. *Lyssa bei Mensch und Tier*, Urban und Schwarzenberg, 1926.
7. Webster, L. T., and Dawson, J. R. *Proc. Soc. Exper. Biol. & Med.*, 32:570-573, 1935.

Animal and Human Diseases

. . . Animal disease has a close connection with human disease, and students of public health will find much to think over in the Ministry of Agriculture's *Report of Proceedings under the Diseases of Animals Acts for the Year 1936*. Bovine tuberculosis is but one of the many subjects dealt with. It was reported to exist on 26,744 premises, and after examination by veterinary inspectors, 23,802 animals were

ordered to be slaughtered, an increase of nearly 1,500 on 1935. The number of Attested Herds was 55 at the beginning of the year, and rose to 140 on 31st October, after which a rapid increase brought the total to 192 at the end of the year. (During the first quarter of the present year 58 further herds were added to the register.)—*J. Roy. Inst. Pub. Health & Hyg.*, 1, 2 (Nov.), 1937.

Tuberculosis Among Children and Young People in Cattaraugus County, N. Y.*

JOHN H. KORNS, M.D.

Director, Bureau of Tuberculosis, Cattaraugus County Department of Health, Olean, N. Y.

IN discussing the problem of tuberculosis among children and young people in Cattaraugus County, one may well take into consideration various factors such as the population density and its composition, the prevalent occupations, the economic level, past and present tuberculosis mortality rates for all ages, and the antituberculosis agencies or facilities available. Tuberculosis among children is and in recent years has been only a minor health problem in this county. For this reason, and because of the importance of coördinating if possible the administrative control of tuberculosis in children with that in adolescence and early adult life, the writer has taken the liberty of extending in this presentation the age period up to 25 years.

The county lies among the foothills of the Allegheny mountains in southwestern New York. Its area is 1,343 square miles. Its population of 72,000 which has been almost stationary since 1920, is rural and semi-rural except for 31,000 persons residing in two small cities. The county is remote enough from large cities not to be suburban. Ninety per cent of the population are native born whites. There are about

1,000 Indians in two reservations and about 450 Negroes who live mostly in Olean, a city of 22,000. Agriculture, particularly dairying, is the main occupation, although about one-third of the inhabitants are in some form of industry. Only a few of these industries, however, appear to carry a tuberculosis hazard. Economically the county ranks in the upper third of the rural counties of New York State.

The crude mortality rate from tuberculosis was low for the county compared with that for New York State, when the County Health Department was organized in 1923, being for that year 72.6 per 100,000 for the county and 97.9 for the state. During the 5 years prior to 1923, the rate in the county was stationary, while since that time there has been a progressive decrease. Divided roughly into 5 year periods, the annual mortality rate for all forms of tuberculosis was:

	<i>Per 100,000</i>
1918 to 1922 inclusive	69.6
1923 to 1927 inclusive	55.7
1928 to 1932 inclusive	42.5
1933 through June 1937	28.9

Beginning with 1916, a County Tuberculosis Sanatorium has been available for the free care of resident tuberculous patients. Up to 1923 the institution had only one public health nurse

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

for field work. Since 1923 there has been a comprehensive, full-time County Health Department, with an adequate number of public health nurses for field supervision and a Director of the Bureau of Tuberculosis. For the greater part of this time the Director has been, concurrently, the Superintendent of the Sanatorium. He has conducted diagnostic clinics throughout the county, to which physicians have referred patients and to which nurses, with the physicians' consent, have invited contacts of tuberculosis patients. A consultation service in patients' homes has been furnished the physicians throughout the county. Both in clinics and consultations a portable X-ray equipment has been used. In addition, a tuberculin and X-ray survey was made among Reservation Indians because of their high tuberculosis death rate. X-ray surveys of juniors and seniors in high schools and of school teachers have been made as educational and case finding measures. Tuberculosis eradication among cattle has been a recent development, begun in 1923 when 58,928 head were tested with 7.1 per cent reactors. Elimination of reactors proceeded so rapidly and supervision of cattle has been so thorough that for the last 5 years less than 0.5 per cent have reacted.

TUBERCULOSIS AMONG CHILDREN

Under the conditions outlined, particularly with a low and steadily declining total tuberculosis death rate, one would expect very few to die from tuberculosis in infancy and childhood. Such is the case. During the past 15 years there were 17 tuberculosis deaths under 15 years of age, and none has occurred among county residents in this age group since 1932. On analysis this shows the annual tuberculosis specific death rate to have been, approximately, for whites under 15, 4 per 100,000 and for Indians, 137.

Data on tuberculin tests and diagnoses cover only the period since the beginning of 1928, and less accurately for Indians than for whites. In the past 9½ years only 9 whites and 5 Indians under 15 have been found to have reinfection tuberculosis. In addition some were seen with cervical lymph node lesions but these were considered primary. Tuberculin testing has been a routine procedure for all clinic children under 16. Those children who were not known to have been exposed to a positive sputum were observed to respond quite infrequently to 0.1 mg. of Old Tuberculin intradermally. This entire group of 2,621 clinic children tested during the 9 years prior to 1937 showed an incidence of 9.2 per cent positive reactions. Further sub-divided, during the first 3 years of this time the percentage of reactors was 15.6, while during the last 6 years it was only 4.8. About half were in the 10-15 year age group, and inasmuch as the composition of the clinic and the distribution by age were similar during the whole period, the figures suggest strongly that the so-called non-contact child is being infected less frequently than a few years ago. The clinic children under 16 tested during 1936, numbering 226, heavily loaded by 28 per cent of intimate tuberculosis contacts, showed only 11 per cent positive. A tuberculin survey of children in 85 rural and village schools showed 8.2 per cent positive among 1,183 tested under age 16, the majority being 10 years of age or older. A similar survey of 226 Indian children under 15 revealed 23 per cent positive reactors. This higher incidence of infection among Indian children is not surprising in view of the fact that the total Indian tuberculosis death rate has been in recent years 6 times that among whites. On the basis of the rarity of tuberculosis deaths among children, the infrequency of reinfection tuberculosis

before age 15, the apparent mildness of primary tuberculosis, and the decreasing incidence of tuberculous infection in the same age period, the administrative measures which have been adopted and which are at present operative aim at less medical observation and care of infected children than formerly. Primary tuberculosis is not institutionalized but is kept in the home, while the open case, if found, is removed and treated. Re-X-raying of positive reactors with or without demonstrable primary lesions is not done until 14, from which age annual X-ray examinations are done until 25. Exceptions are made of course where exposure continues or symptoms develop. Adequate home observation by nurses is available and private physicians are coöperative. These conditions are important prerequisites to this plan. This shifting of emphasis from tuberculosis during childhood came about not only because of the relative unimportance of the problem but because of the questionable value of the former plan of placing children with primary tuberculosis in an institution. In our experience, some of these children with primary lesions, in spite of prolonged institutional care in childhood, proceed to develop in adolescence reinfection tuberculosis even though no known exogenous reinfection occurs. The two instances of this kind recorded in the past 10 years were in girls who had had prolonged exposure within the home as little children prior to the breaking of the contact and who had shown X-ray evidence of primary lesions in the chest.

TUBERCULOSIS IN ADOLESCENTS AND YOUNG ADULTS

What concerns the tuberculosis workers in Cattaugus County more than the tuberculosis problem in children is the problem in adolescence and early adult life. It is believed that while many of those developing rein-

fection tuberculosis between ages 15 and 24 have been infected as infants or small children within the home, a still larger number probably have their first infection during or after the high school age and from sources outside the home. This belief is based partly on the low incidence of positive tuberculin reactions under 16 and partly on the failure to trace the source of the infection to the home in the majority of the adolescent and early adult cases. Routine examination of household contacts for several years enables one to speak with some assurance on this point.

Since the beginning of 1928, 106 persons between ages 15 and 24 have been found to have reinfection tuberculosis. In only 31 instances was it at all definitely established that the primary infection had occurred within the home. In a few it was strongly suspected to be among schoolmates or other associates outside the home. Theoretically, then, were all the tuberculosis families in a community known to the health department and, over a period of years, their contacts were properly examined, less than a third of the secondary reinfection cases in the above age group might be discovered, unless additional case finding methods were used.

In view of facts like these, the question arises as to how one can coördinate a tuberculosis program for young people with that for children. Methods followed and results obtained in Cattaugus County may be noted to see whether any light is thrown on the problem. Tuberculosis deaths under age 25 during the past 15 years numbered 105, an average of 7 per year. Subdivided roughly into three 5 year periods, the annual deaths averaged for the successive periods approximately 11, 7, and 3, so that there has been, in this age period, an encouraging decline in deaths. Analyzed for whites and Indians (there being no bona fide

TABLE I

*Tuberculin Reactors Observed Roentgenographically for Periods Varying from 3 to 12 Years**Age, in Years at End of Observation Period*

Age in Years, at Beginning of Observation Period	Age, in Years at End of Observation Period											Total
	Under 15	15	16	17	18	19	20	21	22	23	24	
1	2	..	..	..	..	..	..	..	..	..	..	2
2	2	..	..	..	..	..	..	..	..	..	..	2
3	8	..	..	..	..	..	..	..	..	..	..	8
4	10	..	..	..	..	..	..	..	..	..	..	10
5	9	1	1	..	..	..	..	..	..	..	..	11
6	16	2	1	..	1	..	..	..	..	..	..	20
7	8	4	3	..	2	..	..	..	..	..	..	17
8	14	5	3	2	..	2	..	..	..	..	..	24
9	7	3	6	2	2	..	2	1	..	..	..	23
10	9	5	6	8	2	3	..	..	..	..	..	33
11	5	4	9	10	2	3	2	..	..	..	..	35
12	..	..	8	8	4	8	4	..	..	..	..	32
13	..	..	3	5	6	9	4	2	..	3	..	32
14	..	..	..	10	7	6	3	1	1	1	..	29
15	..	..	..	..	10	2	4	5	..	3	..	24
Over 15	..	..	..	..	..	8	15	12	18	10	12	75
Total	90	22	40	45	36	41	34	21	19	17	12	377

tuberculosis deaths among Negroes) these figures show an annual tuberculosis specific death rate per 100,000, under 25, for the three periods to be approximately as follows:

	Whites	Indians
1923 to 1927 inclusive	28	475
1928 to 1932 inclusive	17	295
1933 through June 1937	9	93

Forty-nine of the above 105 deaths occurred since the beginning of 1928, and 42 of these were in the 15-24 year age period, 55 per cent being females. The 106 cases of reinfection tuberculosis in the 15-24 year age period which have been recorded since 1928 have come to light through three sources (1) clinic patients referred by physicians; (2) cases reported by institutions outside the county; (3) cases discovered through the routine follow-up of juvenile tuberculin reactors, or through group X-ray surveys by the County Health Department. Ninety-one of the cases were referred by physicians for diagnosis, or confirmation of diagnosis, or were referred by institutions, while 15 came as a result of the department's observation which often had begun

many years earlier. Those in the larger group nearly all had had symptoms at the time of diagnosis while those in the smaller group did not. This is reflected in the classification of cases of pulmonary tuberculosis at the time of diagnosis which showed in the larger group 26 per cent in the minimal stage and in the smaller group 67 per cent. Since January, 1936, 47 per cent of all new reinfection cases under age 25 were found as a result of routine follow-up of reactors or the X-raying of groups and of these 86 per cent of the pulmonary cases were in the minimal stage.

COORDINATION OF ADMINISTRATIVE METHODS FOR CHILDREN AND FOR YOUNG PEOPLE

To illustrate the type of medical supervision of juvenile reactors practised by the County Department of Health, two tabulations have been made. Table I shows for 377 reactors the age at the beginning of observation and for all but 90 of them the age to which observation has been extended up to August 1, 1937. (For the sake of brevity the 90 reactors whose ob-

servation has not yet continued to age 15 are totalled in one column.) These observations cover 2,382 person-years and include 1,966 X-ray examinations of the chest. Table II shows the tuberculosis findings resulting from the above observations. In Table II one is struck with the large number who have developed reinfection tuberculosis among those reactors previously exposed to open cases, and the relatively small number among those reactors not known to have been so exposed. Fourteen among 119, *i.e.* 11.7 per cent, of those reactors known to have had household exposure to a positive sputum have up to the present developed reinfection tuberculosis, while only 3 among 198, or 1.5 per cent, of those reactors not known to have had such exposure have done so. It will be noted also that those reactors showing X-ray evidence of primary lesions appear to develop reinfection tuberculosis in a much higher percentage than do those without such demonstrable lesions.

This appears to give a definite clue as to where much of the reinfection tuberculosis will be found in young people. It will be among those who

have had intimate exposure to open tuberculosis. Naturally among children this is, commonly, within the home. It is self-evident then that this phase of preventive work—for early diagnosis is preventive work—among adolescents and young adults may be closely linked with that among children.

One is much less certain how to secure early diagnosis among the larger group of young people who give no history of intimate contact. There is, perhaps no compelling reason why the private physician should not enter as a leader the field of preventive medicine and tuberculin test children and young people repeatedly on a wide scale, then have the reactors X-rayed. Ordinarily, however, he does not do this, but waits until the patients seek him. They seek him because of symptoms, and by the time symptoms have developed most of these young people showing tuberculosis have moderately advanced or advanced lesions.

ADDITIONAL ADMINISTRATIVE METHODS AMONG YOUNG PEOPLE

The tuberculosis problem among young people is causing concern in many areas both in this country and

TABLE II
History of Exposure and X-ray Findings Among Tuberculin Reactors

Number of Reactors	<i>In Known Contact</i>		<i>In Probable Contact</i>	<i>Having No Known Contact</i>	Total	<i>Reactors Developing Reinfection Tuberculosis</i>
	<i>In Known Contact With Open Tuberculosis</i>	<i>With Tuberculosis Not Shown To Be Open</i>				
Showing X-ray evidence of primary tuberculosis	56	12	2	33	103	12 11.6%
Showing no X-ray evidence of primary tuberculosis	63	34	12	165	274	6 2.1%
Total	119	46	14	198	377	
Reactors developing reinfection tuberculosis	14 11.7%	0	1 7.1%	3 1.5%		18* 4.7%

* Among these reinfection cases are included three under 15 years of age. Of these, 2 were pulmonary and 1 osseous.

abroad. It is easy to say that the X-ray examination is the method which must be generally adopted, and it is true. It is certain that if physicians and young people became tuberculosis conscious and demanded a far wider use of X-rays, the proportion of cases diagnosed in the minimal stage would be greatly increased. Here one enters the fields of health education and economics, both of which are fundamental in dealing with tuberculosis.

In Cattaraugus County the matter of early diagnosis in young people is receiving consideration. Some progress can be recorded. If the last decade be divided into two 5 year periods, in the first of these only 20 per cent of those between 15 and 24 years of age showing pulmonary tuberculosis were diagnosed in the minimal stage, while in the second 5 year period 55 per cent were so diagnosed. Besides the X-ray follow-up of clinic reactors, numerous X-ray surveys of juniors and seniors in high school have been made. Among 2,400 students X-rayed in this way only 3 reinfection cases were discovered. A tuberculin and X-ray survey of 650 Indians did not reveal new active tuberculosis at the time but resulted in adding to the roster many tuberculin reactors in the 15-24 year age group. Subsequent reexamination of these has revealed 2 cases of pulmonary tuberculosis. The County Health Department offers at film cost X-ray services to all juniors and seniors in high school annually, to freshmen in the one college within the county, to nurses in hospitals, to young pregnant women, and to young workers in industry. The physicians are encouraged to use widely the free clinic and consultation X-ray service offered by the department and the free service for examining sputum offered by the County Laboratory. The coöperation of physicians is eagerly solicited to the end that prolonged isolation of open cases may be enforced.

Even compulsory institutional care through court order has been resorted to. As for direct educational efforts, these include conferences with patients, family members, and physicians, talks to high school students and teachers and to Parent Teachers' Associations, distribution of literature especially in high school, and the use of the press and the radio. While these methods may all be helpful, it is felt that the X-ray examination of a young person's chest, with a word of explanation added, serves as useful an educational purpose as any.

While high school students are more accessible for examination than others of this age, a large proportion, though fewer than formerly, leave school at the 8th grade. Those going early into industry are now being X-rayed in many instances as a result of more stringent requirements of insurance companies which provide compensation.

There would seem to be justification for repeated X-ray surveys of apparently healthy young people for the reason, already stated, that more than two-thirds of the reinfection cases in this age period could not trace their source of infection, and for the additional reason that occasionally through such surveys young persons may be diagnosed who are still being exposed to mild, unreported but open cases of pulmonary tuberculosis in the home or elsewhere.

The data assembled in this paper show a definite concentration of new cases among the contacts. It must be remembered that these data represent concentrated effort in this group as well. If the entire youth of the county were X-rayed as intensively and persistently as this group has been, the yield of reinfection cases in the larger group undoubtedly would be higher.

The above methods are mentioned not because they are unique or because they have been particularly successful.

Until something better is found, however, it seems worth while to follow them. Reviewing the work of the past decade, it would seem that the most important single factor in helping reduce the tuberculosis deaths among children and young people has been the consistent effort to place positive sputum patients in a sanatorium or otherwise isolate them, and to keep them under such isolation until sputum is negative. The open case is being admitted to a sanatorium with more promptness following diagnosis than was the case a few years ago. There is no waiting list for admission to the sanatorium. At present there are only 3 positive sputum patients known in the county who are not in sanatoria or who have not had sanatorium training and care.

One method of attacking the problem that has not been used is attempted artificial immunization. The department still operates on the theory that it is better for the child to grow up without infection with tubercle bacilli. Possibly sometime this view will be discarded. In any case, there is no doubt general agreement that heavy exposure to virulent tubercle bacilli in childhood constitutes a health liability likely to handicap the child's future, and that this should be prevented by public health organizations, in coöperation where possible with physicians, voluntary health organizations, and hospitals.

No doubt the most economical method of securing early diagnosis in young people in Cattaraugus County theoretically would be to perform periodic tuberculin tests on a large scale, particularly among adolescents. fluoroscoping the reactors. There are in this county, however, practical difficulties in this plan: (1) In a large proportion of instances consent cannot be obtained for routine repeated tuberculin tests, except in established clinics where the young person usually is ex-

amined because of known exposure or because of a physician's request. (2) Fluoroscopy is relatively less valuable than the X-ray film and entails a great deal of time and labor on the part of the physician, since it cannot be delegated to a technician.

CONCLUSIONS

1. Tuberculosis among children in Cattaraugus County is a minor health problem. This is natural as there is a low, progressively decreasing total tuberculosis death rate; the tuberculosis infection incidence among children also is low and appears to be decreasing.

2. Children with primary tuberculosis are not placed in institutions, but persons with open reinfection tuberculosis are isolated promptly, usually in sanatoria. This probably has been the most effective measure in keeping tuberculosis among children at a low level and in reducing the incidence of infection.

3. Tuberculosis in adolescents and young adults is a more serious problem in Cattaraugus County though it appears to be less disturbing than it was a decade ago.

4. Besides the importance of close X-ray observation through adolescence into early adult life of those who have had childhood exposure to tuberculosis—a procedure which will disclose the highest percentage of reinfection cases—a wide use of the X-ray, with or without preliminary tuberculin testing, among young people in high school and in industry, is useful in increasing the proportion of minimal cases of pulmonary tuberculosis discovered. These measures have educational as well as diagnostic value. Practically, when funds are limited, intimate contacts of open cases should be repeatedly examined by X-ray. This should be done thoroughly first. Then, if there are additional funds and facilities, other groups of young people may be similarly examined.

Use of Dishwashing Machines: Pasteurization of Eating Utensils*

WESLEY C. COX, M.D.

Lieut. Colonel, Medical Corps, U. S. A.

Laboratory Service, Walter Reed General Hospital, Army Medical Center, Washington, D. C.

AN investigation of machine dishwashing conducted at the Army Medical Center, Washington, D. C., during August, 1935, showed that the machines were improperly operated and in many instances the processed utensils had organisms of the respiratory and intestinal groups on their surfaces. A study of the fundamental principles of mechanics, thermodynamics, chemistry, and bacteriology involved in machine dishwashing was undertaken in order to determine the optimum operating temperatures and time periods for the wash and rinse processes. The 21 machines in daily use in the wards, messes, and restaurants of the Post, consisting of 19 intermittent type, single tank machines, a single tank conveyor machine, and a multiple tank conveyor machine, furnished adequate material. An automatically controlled intermittent type single tank machine¹ developed as a result of this investigation, was installed during these studies.

Speed is an essential requirement in machine dishwashing, especially during periods of peak load. The utensils must be freed of soil and bacteria and

rendered physically and bacteriologically clean in a minimum time. This is accomplished by the action of the wash and rinse processes, which differ in operation in the single and multiple tank machines. In the single tank machine the wash water is pumped from the wash tank and sprayed over the surfaces of the utensils; the water then passes through the wash tank strainers or screens which retain the major portion of the soil removed from the utensils; reenters the wash tank; and is recirculated. Small particles of soil and bacteria pass through the strainers and are deposited upon the surfaces of the utensils. At the termination of the wash process, although all visible soil may have been removed from the surfaces of the utensils, they are still contaminated in direct proportion to the bacterial content of the wash water. The final cleansing of the utensils is accomplished by the action of the rinse water which is supplied to the machines from the hot water line. The rinse water is sprayed over the utensils, enters the wash tank diluting the detergent solution, overflows into the trap flushing away particles of soil and unsaponified grease. Reduction of the number of organisms in the wash water is effected during each rinse process.

*Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

Multiple tank machines are equipped with separate tanks from which the wash and rinse waters are continuously circulated over the surfaces of the utensils. The action of the wash process is identical with that of single tank machines. The utensils reach the rinse process contaminated with minute particles of soil and bacteria which together with soil and bacteria on the conveyor belt are flushed into the rinse tank by the action of the rinse sprays and recirculated. Unless there be a final rinse with clear water, supplied directly from the hot water line, the utensil surfaces will remain contaminated with soil and bacteria.

The deposit of bacteria on the surfaces of utensils during the wash and rinse processes was demonstrated by processing sterile Petri dish bottoms (150 x 15 mm.) at 100° F. in tap water seeded with broth cultures of test organisms. Agar pour plates were made following processing in this manner, and read after 48 hours' incubation at 98° F. Table I shows the results obtained in single tank machines seeded with a mixture of broth cultures of *B. coli* and *Staphylococcus aureus*.

Any factor which favors the deposit of bacteria on the surfaces of utensils during processing, or protects organisms so deposited from free detergent and thermal action, lowers the efficiency of the wash and rinse operations.

The detergent and thermal actions of the wash processes are important. An effective detergent aids in the rapid removal of soil from utensil surfaces without causing precipitation of insoluble alkaline salts and gummy alkaline soaps, which, when present, are deposited as a sticky film upon the utensil surfaces by the mechanical action of the wash process. Three detergents were tested: (a) trisodium phosphate technical; (b) issue washing

TABLE I

Deposit of Bacteria on Dishes During the Wash Process

<i>Organisms per c.c. of Wash Water</i>	<i>Number of Dishes Processed</i>	<i>Average Number of Organisms per Dish</i>
420	47	39
960	49	52
2,100	48	87
11,800	49	244
43,000	49	377
76,000	48	482
97,000	49	Over 500

TABLE II

Comparison of Bacteria Counts of Utensils Processed with Trisodium Phosphate, Issue Washing Soda and the Schwartz and Gilmore Detergent

<i>Detergent</i>	<i>Number of Utensils Tested</i>	<i>Average Number of Organisms per Utensil</i>
Trisodium Phosphate	288	41
Issue Washing Soda	288	32
Schwartz and Gilmore Detergent	288	17

soda containing 25 per cent sodium bicarbonate and 60 per cent sodium carbonate; (c) a compound developed by Schwartz and Gilmore² containing sodium hexametaphosphate. The comparative amounts of precipitate formed by these detergents upon addition to hard water was demonstrated in the following manner: A 0.25 per cent solution of each detergent was prepared in tap water of 5 grain hardness and compared in the photometer with a distilled water standard and 0.25 per cent solutions of the detergents in distilled water. The standard and the solutions of the detergents in distilled water gave readings of 100. The readings of the tap water solutions were as follows: Schwartz and Gilmore detergent, 99.7; trisodium phosphate 93.0; issue washing soda 78.0.

These detergents were used over a period of 60 days in dishwashing machines of similar type in 3 different

ward diet kitchens. At the end of the test period the utensils and the interior of the machine using the Schwartz and Gilmore detergent were free of film. The machines in which trisodium phosphate and issue washing soda were used were heavily encrusted with film and it was necessary to hand scour the dishes, glasses and silverware processed, at weekly intervals, in order to remove the film. Film is not only unsightly but forms a protective coating for bacteria which are caught on the gummy surface, reducing rinse efficiency. The insoluble salts and soaps when present are carried over into the rinse tank in multiple tank machines and cause film deposit during the rinse process. Sodium hexametaphosphate prevents the precipitation of insoluble alkaline salts and soaps responsible for film formation by forming soluble complexes with the calcium and magnesium ions present in the wash water, and permits free mechanical, detergent, and thermal action throughout the wash and rinse operations.

Hall³ and Hall and Schwartz⁴ have shown that under similar conditions, utensils processed with the Schwartz and Gilmore detergent were bacteriologically cleaner than those processed with trisodium phosphate. Bacteria counts were made daily, using the swab method, during the period the 3 detergents were under test. The utensils processed with the Schwartz and Gilmore detergent had fewer organisms on their surfaces than those processed with trisodium phosphate or issue washing soda. The results of these tests are shown in Table II.

Hall and Schwartz⁴ and Mallmann⁵ have reported germicidal activity for various detergents when tested under laboratory conditions. In actual dish-washing practice it is impossible to evaluate the bactericidal activity *per se* of a detergent because of the constant

changes in concentration, chemical composition, and pH which take place during the wash and rinse operations.

Heat is the only active bactericidal agent of the wash and rinse processes unless there be an active germicide, such as chlorine, present in the solutions. The number of non-spore-bearing organisms in the wash water of single tank machines and in the wash and rinse waters of multiple tank machines is in inverse ratio to the temperature used. Each succeeding load of utensils should be processed in water containing a minimum of organisms: This is accomplished when thermal death of non-spore-bearing organisms entering the wash and rinse tank waters is effected prior to the processing of the next load of utensils. The survival of bacteria from run to run results in heavy bacterial contamination of the wash and rinse waters. Cumming and Yongue⁶ reported an increase in the number of organisms per c.c. of wash tank water from 12,000 to 250,000 in a 5 hour period. Krog and Dougherty⁷ reported over 900,000 organisms per c.c. in a sample of wash water from a public diner. The bacteria count of the wash tank water of a multiple tank machine operated at 120° F. for 90 minutes increased from 317 per c.c. to 24,600 per c.c. The count of the rinse tank water, operated at 140° F. increased from 7 per c.c. to 2,800 per c.c. during the same period. Under identical conditions using a 165° F. wash and a 180° F. rinse, the wash water count increased from 27 per c.c. to 184 per c.c. and the rinse water count from 1 per c.c. to 18 per c.c. The bacteria count of the wash water of an intermittent single tank machine operated for 90 minutes using a 120° F. wash and a 140° F. rinse, increased from 326 per c.c. to 22,800 per c.c. Using a 160° F. wash and a 180° F. rinse, the bacteria count per c.c. of the

TABLE III

Bacteria Counts of Wash and Rinse Waters for Standard Processing Periods at Varying Temperatures

Multiple Tank Machine

Wash Tank Temp. F.	Bacteria per c.c. Wash Tank Water		Rinse Tank Temp. F.	Bacteria per c.c. Rinse Tank Water	
	After 1 Minute	After 90 Minutes		After 1 Minute	After 90 Minutes
120°	317	24,600	140°	7	2,800
130°	291	19,400	150°	9	2,200
140°	186	2,400	160°	5	281
150°	93	320	170°	5	94
160°	42	214	180°	2	57
165°	27	184	180°	1	18
170°	12	67	190°	1	12

Intermittent Single Tank Machine

Wash Tank Temp. F.	Rinse Water Temp. F.	Bacter per c.c. Wash Tank Water	
		After 1st Run	After 90 Minutes
120°	140°	326	22,800
130°	150°	301	17,500
140°	160°	213	2,600
150°	170°	118	289
160°	180°	16	41
170°	190°	5	22

wash water increased from 5 per c.c. to 41 per c.c. Table III shows the results of the operation of single and multiple tank machines for a standard time period at varying wash and rinse temperatures.

The wash tank water of intermittent single tank machines, is subject to changes in temperature during operation. Air at room temperature enters the wash chamber during the loading and unloading, cooling the walls of the machine and the residual water in the exposed wash lines. The utensils and rack enter the chamber at room temperature. An average period of 10 seconds is required to bring the utensils and chamber walls to the temperature of the wash tank water. During this period the cooler water returning to the wash tank lowers the temperature of the wash tank water. The average reduction when the wash process is

operated between 140 and 160° F. is 3°. The sources of heat used in mechanical dishwashing are not flexible enough to overcome this drop immediately, and from 10 to 15 seconds are required to return the wash water to the original temperature. The wash water of multiple tank machines is not subject to these variations. Rinse water delivered to the machine by exposed hot water lines is subject to cooling between runs. The reduction in wash water temperature may be overcome by processing at a temperature 3° F. higher; that of the rinse water by proper installation of the hot water lines.

The efficiency of the wash process of all types of machines is affected by: (a) the thoroughness of the scraping of the utensils. (b) the position of the utensils in the wash chamber. and (c) the mechanical action and pattern of

the wash sprays. The removal of all possible soil by efficient scraping reduces the soil load and conserves detergent powder. Proper position of the utensils is necessary; if crowded together full detergent action of the wash water is not obtained. Glasses, bowls, and deep lipped utensils must be placed on edge in order to avoid accumulation of wash water thus preventing detergent action. Spray nozzles and rinse lines may become clogged with particles of soil, causing dead areas which escape effective processing. The manufacturer's setting of the wash and rinse sprays must be preserved, for if the streams of water strike each other the detergent force is reduced to zero.

Utensils soiled with moist proteins (egg albumin and egg yolk), and protein and starch mixtures (mashed potatoes) are readily processed at wash water temperatures from 140 to 190° F. without "cooking" action. Dried protein and protein and starch mixtures are difficult to remove at any wash water temperature. Utensils so soiled should be soaked in water prior to processing. All visible traces of moist "soft boiled" egg yolk and mashed potatoes were removed from utensils during a 30 second wash process, while it required a minimum wash process of 120 seconds to remove similar amounts of dried egg yolk and mashed potatoes.

The rinse process of single tank machines should be operated only for suf-

ficient time to flush the utensil surfaces thoroughly. Excessive rinsing causes dilution and waste of the detergent used. Rinse efficiency is in direct proportion to the force and temperature of the water. Effective rinsing is obtained in 10 seconds in single tank machines at 180° F. and 30 to 50 lb. pressure. A 20 second rinse at 180° F. should be used in multiple tank machines equipped with rinse tank only, in order to effect thermal death of non-spore-bearing organisms carried over from the wash process.

Cleanliness of the working parts of machines is essential. Spray nozzles should be detached and cleaned daily. The interior of the chamber, the strainers, tanks, the door grooves and overlaps should be cleaned after each period of use. Massive contamination of the wash and rinse waters results unless the machines are kept clean. Bacteria counts as high as 50,000 per c.c. were obtained from samples of wash water from dirty single tank machines. These machines were operated as usual but purposely permitted to go without cleaning. The wash tank strainers were emptied but not cleaned and the wash tanks were not flushed after emptying. After standing for 14 hours at temperatures from 78 to 90° F. the wash tanks were filled with clear tap water and the machines operated for a period of 2 minutes. Following this, samples of the wash waters were obtained for bacterial count. Table IV gives the results of the wash water counts.

Cumming and Lynch⁶ and Cumming, Spruit and Reuter⁹ showed that used eating utensils were contaminated with organisms of the respiratory group. Krog and Dougherty⁷ found *B. coli* in the rinse waters of 19 public bars and taverns. Mallmann and Devereux¹⁰ reported finding streptococci (hemolytic, nonhemolytic and viridans) on used beverage glasses. Organisms

TABLE IV

*Bacteria Count per c.c. of Wash Water;
Dirty Single Tank Machines*

<i>Machine No.</i>	<i>Organisms per c.c. Wash Water</i>
1	26,000
9	31,000
10	18,000
11	50,000
12	8,200
36	34,000
H.H.	6,100

of the respiratory and intestinal groups were found on improperly processed eating utensils at this station. In a preliminary study of the rôle of the tubercle bacillus in dishwashing, conducted at this laboratory, tubercle bacilli were isolated from spoons used by persons with active cases of this disease. In addition to the organisms mentioned, soil bacteria, yeasts and molds and air-borne contaminants are commonly present. The tubercle bacillus and the thermophilic bacteria of the respiratory and intestinal groups are the most resistant to heat of these organisms, the spore bearers excepted. Since heat is the only constant bactericidal agent in machine dishwashing, processing at temperatures and for time periods sufficient to cause thermal death of the tubercle bacillus and the thermophilic bacteria should reduce viable organisms in the wash and rinse waters and on the processed utensils to a minimum. A 60 second wash process at not less than 160° F. followed by a 10 second rinse process at 180° F. was adopted for intermittent single tank machines and a 40 second wash process at not less than 165° F. followed by a 20 second rinse at 180° F. for single and multiple tank conveyor

machines. Tests conducted regularly for over 1 year on all machines showed that utensils processed at these standards were bacteriologically clean. The wash water of an intermittent single tank machine, in the restaurant, after 12 hours of almost continuous use, contained 179 organisms per c.c., of which 23 were non-spore-bearers. The bacteria counts of processed dishes, glasses, and spoons averaged 15 non-spore-bearing organisms per cultured surface. The methods of processing have been carefully checked using a culture of *B. coli* (U. S. P. H. S. strain, regularly reduced 99.99 per cent in 30 seconds at 160° F. in milk or buffered distilled water). Wash tanks of single and multiple machines were seeded with 20 c.c. of an 18 hour broth culture of this organism. Sterile Petri dishes were processed at the standard temperature and time periods. The broth culture was introduced into the wash tank during the first 10 seconds of the wash process in order to simulate the actual detergent action. Immediately following each run samples of the wash and rinse waters were obtained for count and agar poured into the Petri dishes which were incubated for 48 hours at 98° F. A 99.99 reduction of the or-

TABLE V

Bacteria Counts of Dishes and Wash and Rinse Waters After Processing in Machines Heavily Inoculated with B. coli

*Intermittent Type Single Tank Machine**

<i>Bacteria per c.c.</i>	<i>Av. No. Bacteria per c.c. Wash Water at End of Each Run</i>	<i>Number of Utensils Processed</i>	<i>Av. Number Bacteria per Utensil</i>
<i>Wash Water Control</i>			
600,000	49	210	14

Multiple Tank Machine †

<i>Bacteria per c.c.</i>	<i>Av. No. Bacteria per c.c. at End Each Run</i>		<i>No. of Utensils Processed</i>	<i>Av. No. Bacteria per Utensil</i>
<i>Wash Water Control</i>	<i>Wash Water</i>	<i>Rinse Water</i>		
700,000	55	12	252	9

* 60 second wash at 160° F., 10 second rinse at 180° F.
† 40 second wash at 165° F., 20 second rinse at 180° F.

ganisms seeding the wash tank waters was obtained. Controls were run using the same amount of broth culture at a wash temperature of 100° F. and a rinse temperature of 140° F. The results of these tests are shown in Table V.

Because dishwashing is ordinarily considered a menial task, consisting in the main of tossing utensils haphazardly into a machine containing a solution of a "soap powder," proper administrative supervision is neglected. The evidence presented emphasizes the necessity—from a public health standpoint—of more than merely "washing" utensils.

The term "Pasteurization of Eating Utensils" is used as it is believed that it best described the flash method of thermal destruction of the organisms contaminating used utensils, and conveys to the average mind an accepted standard of cleanliness.

CONCLUSIONS

Soil and bacteria are redeposited upon utensil surfaces during the wash process in single tank machines and during the wash and rinse tank processes in multiple tank machines. Final cleansing is accomplished by the action of the clear water rinse.

The formation of film during processing lowers the efficiency of the wash and rinse operations. Sodium hexametaphosphate by preventing film formation permits free detergent, thermal, and rinse actions.

Thorough scraping of utensils, proper loading, temperature control, mechanical action of wash and rinse sprays, and machine cleanliness are necessary for efficient operation.

Heat is the active bactericidal agent of machine dishwashing. The operation of intermittent single tank machines for a 60 second wash process at not less than 160° F., followed by a 10 second rinse at 180° F. and of multiple tank machines for a 40 second wash process at not less than 165° F., followed by a 20 second rinse at 180° F. results in a 99.99 per cent reduction of the non-spore-bearing organisms contaminating the used utensils.

REFERENCES

1. Cox, W. C. An Automatically Controlled Dishwashing Machine. *A.J.P.H.*, 27:865, 1937.
2. Schwartz, C., and Gilmore, B. H. Sodium Metaphosphate in Mechanical Dishwashing. *Indust. & Eng. Chem.*, 26:998, 1934.
3. Hall, G. O., Jr. The Role of Sodium Hexametaphosphate as an Aid in Sanitation. Thesis—University of Pittsburgh, 1932.
4. Hall, G. O., Jr., and Schwartz, C. Sanitary Value of Sodium Metaphosphate in Dishwashing. *Indust. & Eng. Chem.*, 29:431, 1937.
5. Mallmann, W. L. A Critical Study of Various Types of Detergents and Disinfectants for Use in Dishwashing. *A.J.P.H.*, 27:464, 1937.
6. Cumming, J. G., and Yongue, N. E. Eating Utensil Sanitation. *A.J.P.H.*, 26:237, 1936.
7. Krog, A. J., and Dougherty, D. S. Effectiveness of Methods of Dish and Utensil Washing in Public Eating and Drinking Establishments. *A.J.P.H.*, 26:897, 1936.
8. Cumming, J. G., and Lynch, C. Distribution of Influenza by Indirect Contact—Hands and Eating Utensils. *A.J.P.H.*, 9:25, 1919.
9. Cumming, J. G., Spruit, C. B., and Reuter, F. A. Saliva-borne Infections: Their Transmission through Eating Utensils. *Mod. Med.*, 2:502, 1920.
10. Mallmann, W. L., and Devereux, E. D. Sanitary Survey of Beverage Establishments. *A.J.P.H.*, 25:1007, 1935.

The Rôle of the Nurse in the Control of Syphilis and Gonorrhea*

GLADYS L. CRAIN, R.N.

*Epidemiologist, Massachusetts Department of Public Health,
Boston, Mass.*

THE control of communicable diseases has long been recognized as a basic public health enterprise for the protection of the community. The results of scientific research and discovery, and the activities of local, state and federal health agencies have been markedly successful in the field of prevention and cure. Many of the common communicable diseases have been practically eliminated and great advances in the management of other plagues of mankind presage their rapid reduction to an irreducible minimum.

No small share of this success has been ascribed to public health nurses. Authorities in public health practice give these workers a recognized place in all plans for community health protection because of their training, their numbers (there are approximately 20,000 public health nurses¹ in the United States), and their ready access to homes everywhere. This relationship with families gives them an unprecedented opportunity to disseminate widely facts which the public needs to know in order to cooperate intelligently with physician and health officer in the broad community health program.

Although nurses have been almost universally employed in general communicable disease work, their usefulness in syphilis and gonorrhea control has been questioned and often entirely ignored; yet these diseases are serious menaces to family health, are communicable, and amenable to treatment and public health management. The fact that they are bound up with personal relationships and the customs and taboos of society has inhibited the professional worker and has been a major factor in their continued prevalence.

It has been shown repeatedly that when the nurse has seen the problems of syphilis and gonorrhea control as an indisputable part of her program the obstacles which loom to insurmountable proportions in theory dwindle in practice to those routine difficulties which complicate all types of individual and family health work.

The attitude of the worker is the foundation upon which accomplishment succeeds or fails. This attitude is fostered by education, and the development of a scientific attitude toward these disease problems. It becomes crystallized as the worker acquires a deep respect for personality, a growing ability to see situations through the eyes of the patient, an aptitude for building on strengths rather than weaknesses, and a profound faith in the powers of persuasive teaching and the

* Read at a Joint Session of the National Society for the Prevention of Blindness and the Industrial Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

futility of the weapons of fear and force.

It cannot be too strongly emphasized that effective work in syphilis and gonorrhea control requires informed, well trained workers. Education on the job, through institutes, staff education, and summer school courses, must be accepted as a necessity, and improvement and enrichment of courses in training schools should be stimulated.

Happily, the Washington Conference on Venereal Disease Control Work² in December, 1936, made the old controversy regarding the nurse's responsibility in the control of syphilis and gonorrhea a dead issue. The emphasis upon the family aspects of these diseases, especially their disastrous effects upon mothers and children, offered a challenge to all family health workers, and pointed to the potential value of the community nurse as a case finder and case holder.

It is fortunate that the principles underlying the control of the genito-infectious diseases do not differ greatly from those laid down for other communicable diseases. The spread of infection in any case is not checked until the community is protected from the patient himself, the source of his infection, and all those contacts to whom he may have given the disease. All known patients must have continuous treatment until cured, or rendered non-infective, and must avoid activities which will endanger others. Patients must be found and brought to medical care in the earliest stages of the diseases for the sake of community protection and in order that the best possible results may be obtained from treatment.

The program for syphilis and gonorrhea control has been tersely described under 3 heads: (1) education, (2) investigation, and (3) treatment. Such activities as are intrinsic here dovetail

with the recognized functions of the public health nurse whether in industry, private visiting nurse associations, schools, or health department. Educational and investigative technics are part of her stock in trade, and efforts to bring patients early to medical attention and encourage faithfulness to treatment belong to everyday field work routine.

To return to the 3 point program mentioned above, the following come definitely within the province of the nurse:

Education:

1. Assisting with case holding by seizing every opportunity to clarify the situation in which the patient with syphilis or gonorrhea finds himself. This may be an interpretation of diagnosis; an explanation of the reasons for the arduous treatment regime; an exposition of the why's and wherefore's of clinic red tape, or encouragement by re-emphasizing the hope for cure. The control of syphilis or gonorrhea depends, in the last analysis upon a well informed patient.

2. Assisting with general community education by being prepared to give satisfactory information to those who inquire about the diseases, and those who need to be set right regarding fallacies and misunderstandings and unfounded prejudices.

Investigation:

1. Assisting with the tracing of sources of infection. The nurse's knowledge of the families in her bailiwick is intimate. She enjoys the confidence of patients because of her friendly services, and information withheld from others is often hers for the asking.

2. Making arrangements for family contact examinations as she arranges for dental care, tonsillectomies, and a thousand and one other health emergencies.

3. Assisting with the discovery of the unsuspected case by the unflinching recognition of danger signs whether in health histories or the patient himself, and by implanting a desire for medical attention in all who show deviations from accepted health norms.

Treatment:

1. Sharing with patients who need medical attention (but cannot afford private care) a knowledge of hospitals and clinics where free or low-cost treatment may be obtained.

2. Making definite arrangements with such

treatment centers for the admission of patients who need medical examinations or specific treatment.

3. Recognizing other health and social needs in families where syphilis or gonorrhea is present, and through coöperative agency planning, assisting with the removal or alleviation of conditions which hinder effective treatment and efficient living.

Such are a few of the unmistakable ways in which the public health nurse may strengthen the community program for the control of the genitoinfectious diseases.

The community nurse's chief contribution, however, is to that phase of the syphilis program which has to do with the control of syphilis in pregnancy and the prevention of congenital syphilis.

The statements from Dr. Parran's recent book, *Shadow on the Land*,³ should arouse public health nurses to action:

One million potential mothers in the United States now have, or have had, syphilis. . . .

No woman who has had syphilis can be assured that she will not bear a syphilitic child without treatment during pregnancy. . . .

Each year, 60,000 children are born in the United States with congenital syphilis. . . .

Ten times out of eleven, the syphilitic mother will bear a healthy child if treatment is adequate and is begun before the fifth month of pregnancy.

Three times out of five, the syphilitic mother will bear a healthy child if treatment is begun after the fifth month of pregnancy. . . .

Some treatment, any treatment, reduces the risk of congenital syphilis. . . .

Treatment for the control of syphilis in pregnancy has been standardized and outlined in such form that all who run may read. The results of adequate treatment are dramatic. The ultimate eradication of congenital syphilis which is now taking a terrific toll in lives and in human happiness and efficiency is no Utopian dream. The public health nurse might be a powerful force in accomplishing this desired result. No

other worker is as fortunately placed as she, to investigate, to supervise, and to teach, to the end that all pregnant women may seek medical care early and receive the benefits of adequate treatment for themselves and their unborn children if infection is discovered.

It would seem a valuable experiment for organizations to study the possibilities for assisting with the syphilis and gonorrhea control programs in their own communities, and to bring about an alliance of coöperating agencies to this end. It is certain that until a working plan is developed between medical agency, health department, and nursing association, little profit will come from ventures in this field.

There are other realms of usefulness for the nurse in case finding, case holding, and the follow-up of patients who discontinue treatment. These take on the nature of a specialized service, and are particularly appropriate for workers in clinics, the health department, or other agencies which have a measure of responsibility for syphilis and gonorrhea control.

Follow-up, with all its attendant activities, has long been considered the responsibility of medical social service departments where these have existed in hospitals and clinics. In the work with syphilis and gonorrhea patients, however, such follow-up programs have been necessarily restricted, because of ever-widening ramifications and an already overburdened staff. In few instances has the ground been covered adequately from the angle of public health and present epidemiological standards.

In recognition of the need for strengthening the state program at this point, the Massachusetts Department of Public Health has promoted a plan (with the help of Social Security Funds) for supplementing the existing follow-up services in certain hospitals

in Metropolitan Boston, and in other important clinic centers throughout the state. Under this plan, 9 follow-up workers have been added to the staffs of the larger clinics, although all of the 30 clinics in the state already had basic follow-up services. The state coöperates by making funds available to each clinic to cover salary, clerical assistance, and travel expenses of the new personnel, but assumes no administrative or appointive responsibility.

These workers are public health nurses in the majority of instances, although social workers are also employed. The public health focus is essential to the success of the program. The workers must not lose sight of the importance of mass achievement as distinguished from too much individual effort upon patients who present long-time problems. All complicated case work situations are referred to the hospital social service departments for solution, since rehabilitation of patients and families is as necessary to community well-being as the emergency measures of public health control.

The standard procedure for the follow-up workers includes the immediate investigation of certain classes of patients in the order listed below:

1. Patients who have discontinued treatment for early (primary or secondary) syphilis
2. Identifiable contacts of such patients
3. The pregnant woman with syphilis
4. The infant with acute congenital syphilis, or the child with interstitial keratitis
5. Patients who have lapsed treatment for gonorrhea
6. Identifiable contacts of such patients
7. Familial syphilis in any stage not included in above
8. Patients with late syphilis

Although these workers are doing the emergency follow-up, their approach to patients is not perfunctory. They definitely strengthen case holding in the clinic by re-interpreting diagnosis, by explaining the mystifying or unfor-

tunate happenings in the hospital, which may have discouraged the patient, and especially by making sure that the patient's reinstatement in the clinic will be consummated without annoying accidents.

One of the tragedies of follow-up is to convince a patient of the importance of continuing treatment, and to have him subsequently met at the clinic door by a cold rebuff. Such a person is frequently lost to clinic influence thereafter.

Let it be understood that the patients visited by the workers in the Massachusetts project represent the more difficult group who fail to respond to hospital follow-up letters. Formerly, such patients would have been reported to local health departments as recalcitrant. The advantage of the present type of follow-up is that the worker represents the clinic which the patient is attending and not the board of health. Thus, the patient is not antagonized by implications of delinquency on his part and is reassured regarding the interest of the clinic, and the confidential nature of its services. The success of the new work is shown in an increase in clinic attendance, and a declining number of uncoöperative patients on the books of the local boards of health.

From January 1, 1937, to July 1, 1937, rough estimates⁴ indicate that 2,462 cases of syphilis and gonorrhea have had follow-up visits. Of these, approximately 68 per cent, or 1,683 patients, have been successfully brought back to treatment, or persuaded to seek medical advice. This is an encouraging accomplishment when compared with the best figures obtainable for board of health follow-up. In a 6 year period, 43 per cent of 20,000 patients were found, but there is no information available as to how many actually returned to treatment.

Cases which failed to respond to this new type of follow-up numbered 779, or about 32 per cent. In one district, largely residential, 80 per cent of the patients responded satisfactorily. The congested sections of cities presented the more difficult problems. It would be folly to intimate that such estimates could accurately measure qualitative results. They are but straws in the wind. The program is still experimental, and only a superficial study of figures has been possible thus far. As the work progresses and technics improve, better results are certain (see Table I).

A capacity to learn out of failures as well as successes is a necessary attribute of these workers. Such continuous and serious efforts on the part of the nurses and social workers will at long last bring a definite and demonstrable halt in the spread of the genitoinfectious diseases.

A like service is being offered to private physicians who are shouldering a greater burden than the clinics. The problem has been how to reach this group. The traditional personal and confidential relationship of physician to patient makes for reluctance on the part of the physician to accept help from outside organizations—particularly, the state! During the past year, the department has begun experiments with a confidential serv-

ice. A public health nurse is loaned (on a time basis) to physicians who desire assistance in the follow-up of lapsed cases or contact tracing. The nurse becomes the physician's nurse the moment she enters his office, and at no time does she represent the Department of Health. All identifying data regarding the patient is kept strictly private and is not available for state records. The department has no part in the procedure beyond receiving statistical data and providing personnel.

Of the doctors visited thus far, only a negligible group has failed to avail itself of the service. The program has been too limited up to the present time to quote statistics, but it can be stated that the majority of cases which discontinued treatment or were exposed to infection have been closed to medical care to the satisfaction of physician and patient. There has been nothing to disturb the patient's faith in the physician's interest in him as a person, and in his sincere desire to keep the patient's confidences inviolate.

Public health nursing organizations frequently complain of their inability to carry on any kind of program in syphilis and gonorrhea control work because of the lack of coöperation by the local doctors. Might it not be worth while to experiment with such a scheme as this and build up a new relationship? Loaning nurses on a

TABLE I
RESULTS OF FOLLOW-UP
JANUARY 1, 1937-JULY 1, 1937
*Massachusetts State Project for Supplementing Existing
Epidemiological Services*

Disease	Cases Referred	Visits Made	Results	
			Cases Returned to Treatment	Failures
Syphilis	1,858	3,032	1,335	523
Gonorrhea	528	774	301	227
Undiagnosed	76	126	47	29
Totals	2,462	3,932	1,683	779

time basis to clinics is a widespread practice—why not to the private physician?

Studies of the incidence of syphilis and gonorrhea show that the peak of prevalence of these diseases is found in the age group of 15 to 30 years. This fact should have significance for the public health nurse in industry and in the schools. The tremendous possibilities for educative procedures and for case finding in these situations is only just beginning to be recognized.

CONCLUSIONS

1. Public health nurses in schools, industrial plants, health departments, clinics, and visiting nursing organizations have a definite contribution to make to the control of syphilis and gonorrhea.

2. Provision should be made for acquainting agencies which employ nurses of their opportunities to assist in the control program.

3. Provision should be made for acquainting clinics, private physicians, and health officers with the work which nurses are qualified to do in case finding and follow-up.

4. Provision should be made for the continuous education of the public health nurse in the medical, public health, and social aspects of syphilis and gonorrhea control.

5. Studies should be made of local community needs, and appropriate contributions of the nurse in different types of agencies. Experiments in this field should be evaluated from qualitative and quantitative standpoints.

Syphilis and gonorrhea are major public health problems today, and they are amenable to public health control. There are 20,000 public health nurses in the country. Is it not imperative that the skills of this group be enlisted in the nation-wide campaign which was initiated last December?

REFERENCES

1. *A Survey of Public Health Nursing*. The Commonwealth Fund, 1934.
2. Waters, Lena R. Medical Follow-up of the Venereal Disease Patient. Proceedings of Conference on Venereal Disease Control Work. Dec. 28-30, 1936. Supplement No. 3, *V. D. Inf.* U. S. Public Health Service, Washington, D. C. pp. 99-103.
3. Parran, Thomas, M.D. *Shadow on the Land. Syphilis*. Reynal and Hitchcock, Inc., 1937.
4. Unpublished data from the Massachusetts Department of Public Health.

Cemeteries or Playing Fields?

... When speaking at the International Cremation Congress last month, Lord Horder described burial as a luxury we could no longer afford. Land was needed for building and for the recreation of the people: to continue the uneconomic use of land for the wasteful purpose of burial would be criminal in the face of the social needs of the population. Already most civic

authorities were despairing of finding fresh acres for cemetery purposes and were turning to cremation as a means of preserving the land in the interests of the living. Cemeteries or playing fields? That was the question, and from an educated community there could be only one reply.—*J. Roy. Inst. Pub. Health & Hyg.*, 1, 2 (Nov.), 1937.

A Suggested Program of Control of Amebiasis by Health Departments*

CHARLES F. CRAIG, M.D., F.A.P.H.A.

Colonel, U. S. Army (Retired); Department of Tropical Medicine,
School of Medicine, Tulane University, New Orleans, La.

THAT infection with *Endamoeba histolytica*, or amebiasis, which includes amebic dysentery, is a public health problem in this country is slowly but surely becoming recognized, and it is greatly to the credit of the Mississippi Public Health Association, and of the State Board of Health of Mississippi, that amebiasis has been so recognized for several years and that measures to combat it and to secure reliable data as to its incidence have been pursued by the State Board of Health. This has resulted in more accurate statistics as to the incidence of this infection and, in fact, Mississippi stands almost alone among the states of the Union in possessing any really reliable statistics concerning amebiasis. As I stated in my Presidential Address before the American Academy of Tropical Medicine, in 1936:

The only state which is apparently "amebiasis-conscious" is Mississippi, for in 1932 the State Board of Health reports 481 cases of amebiasis. Whether these were all cases of amebic dysentery, or not, we have been unable to learn, but probably not. At any rate, the State Board of Health in Mississippi is apparently succeeding in obtaining much more accurate information regarding the incidence of amebiasis in that state than in any other state considered in the Survey.

In order to establish the fact that amebiasis is really a public health problem in this country it is necessary to prove that *Endamoeba histolytica*, the cause of this infection, is a pathogenic parasite; that it is present in a significant proportion of the population; and that its presence endangers the health of the individual harboring it. All of these postulates have been fully demonstrated. There is no doubt regarding the pathogenicity of the parasite; the evidence is conclusive that approximately 10 per cent of the population of the United States harbor this parasite; and that at least 50 per cent of individuals harboring it present symptoms caused by it; and that, even in those who present no symptoms, there is tissue invasion, and symptoms may develop at any time, or an amebic abscess of the liver may occur in symptomless individuals. In view of these facts it must be admitted that amebiasis is a real public health problem in the United States and deserves careful consideration by all health departments in regions where infections with *E. histolytica* are known to be present in significant numbers.

Owing to the comparatively large number of individuals that have been found infected in many localities: the difficulty of diagnosing the condition, which must depend upon demonstrating the parasite; and the expense involved in examination and treatment: the pre-

* Presented before the Mississippi Public Health Association at Jackson, Miss., December 9, 1937.

vention of amebiasis is a very complex problem and one that must be handled variously in different localities and under different conditions.

We know that the cysts of *E. histolytica*, the usual transmitting agents, may be transmitted from man to man through a contaminated water supply, either public or private; through the ingestion of contaminated food or drink, such contamination usually being due to infected food handlers; through flies that have fed upon contaminated material and, in turn, have contaminated food or drink by contact or by their droppings; and through the use of human excrement in the fertilization of garden products. Any program looking toward the control of amebiasis must embrace all of these methods of possible transmission and, fortunately most of them can be controlled without undue expense or labor.

As the recognition of *E. histolytica* is absolutely essential before a diagnosis of amebiasis is possible, the first step in the control of this condition consists in the training of physicians and laboratory technicians in the differentiation of this species of pathogenic ameba from the four other species living in the human intestine, all of which are nonpathogenic, so far as known. I believe that the difficulty of differentiating *E. histolytica* from these other amebae has probably been exaggerated, but it is true that one must have considerable experience in the study of the parasitic protozoa of the intestine in order to make the differentiation. It is believed, however, that any well trained laboratory technician or physician trained in the use of the microscope should be able to differentiate this ameba after several days of personal instruction by a qualified instructor and from 5 to 6 weeks' practice in the microscopical examination of the feces and a careful study of the amebae present. Staining methods are also

available that make the recognition of *E. histolytica* a matter of little difficulty after one has been properly instructed in their use and in the morphology of the ameba when stained by these methods.

The first step, then, in a program for the control of amebiasis, is the training of a sufficient number of laboratory workers so that they may be available for the examination of material in regions where the infection is prevalent. Such trained technicians should certainly be available in all city, county, and state health laboratories, and to these laboratories should be forwarded specimens for examination obtained during surveys or from the practising physician. Unless such trained laboratory technicians or physicians are available it would be foolish to undertake any control procedures as we would not know whether or not control measures were necessary in any given locality.

The next important essential in the control of amebiasis is to make this infection a notifiable disease, and in doing so, that the physician be thoroughly acquainted with what is meant by the term "amebiasis." By the term "amebiasis" is meant infection of man with *E. histolytica* without regard to the presence or absence of symptoms of such infection. The term includes cases of amebic dysentery, or diarrhea; of amebic abscess of the liver or other organs; of gastrointestinal symptomatology other than diarrhea or dysentery, and it also includes all individuals presenting the organism in their stools but who have no symptoms of the infection, the so-called "carriers" of *E. histolytica*.

In selecting a nomenclature that would be satisfactory in reporting cases of amebiasis, that recommended in the *Standard Classified Nomenclature of Disease* is considered admirable for the purpose. Under the general term

"Amebiasis" is included amebic infection of any organ of the body, the organ being specified, while separate designations are provided as follows: amebic abscess of brain, liver, or lung; amebic colitis; amebic hepatitis; amebic proctitis; *Amebiasis cutis*; and amebic carrier state. In reporting cases of amebiasis these terms should be employed, if possible, and amebic infection elsewhere in the body than indicated by these terms should be reported as amebiasis, signifying the site of the infection.

It is unnecessary to state that unless amebiasis and its complications are made reportable conditions any system of control of this infection is impossible, and it is certainly true that the lack of such a requirement is responsible for much of our ignorance of the extent and importance of the infection. I believe that if all cases of amebiasis now being diagnosed in this country were reported we would be greatly surprised at their number and importance, from the standpoint of the health of our people, especially in the southern states.

The control of amebiasis can be greatly assisted by the education of the public regarding the importance of this infection and the methods of transmission, as well as those which have been found effective in preventing transmission. Public education is an important part of the program of control, and this is ideally accomplished through publications issued by local or state boards of health. Such publications should include the statement that amebiasis, including amebic dysentery, is not a tropical infection, as is generally believed, but is very prevalent in this country and that, even though symptoms of the infection may not be present, grave complications, as amebic abscess of the liver, may occur. The part played in transmission by symptomless carriers of the infection should be stressed, and the simple hy-

gienic rules which serve to prevent such transmission should be emphasized. The importance of the food handler, either in the home or in public eating places, in the transmission of this infection should be explained, and the fact that if one member of a family is found infected with *E. histolytica* other members are also apt to be infected. Personal hygiene as a valuable prophylactic method should be emphasized and the great importance of a thorough cleaning of the hands before handling food or eating, as well as after the use of the toilet, should be emphasized. It should be stressed that if these very simple hygienic rules were strictly observed by all who handle food, amebiasis would probably cease to be a public health problem in well sanitized localities, as our larger cities and towns. The public should be informed that amebiasis is a strictly preventable infection and it is believed that the education of the public regarding it is a most valuable part of any program looking toward the control of the infection.

In view of the experience gained in the study of the extensive epidemic of amebic dysentery which occurred in Chicago, in which cross-connections between the sewer and the water supply of the hotels concerned was determined as the source of the infection, the inspection of the plumbing of public buildings and hotels becomes a part of a program for the control of amebiasis. Such inspections should be made by properly trained sanitary engineers (as it is often difficult to locate such cross-connection), and should not be trusted to the usual sanitary inspector unless he has been well trained in sanitary plumbing. Just how frequently amebiasis is transmitted in this manner is unknown, but the program of control should include such inspections and the laws prohibiting such cross-connections should be rigidly enforced.

The protection and sterilization of water supplies are important parts of a control program for this infection. It has invariably been noted that, in regions where amebiasis was frequently encountered, the installation of a properly constructed and guarded water supply system has been followed by a great decrease in the number of infections with *E. histolytica*. Water is of little importance as a transmitting agent in towns or cities having such a supply, except in instances such as occurred in Chicago, where a cross-connection between the supply and a sewer caused an epidemic of amebic dysentery. Filtration through filter beds removes the cysts of this ameba and renders the water safe so far as transmission is concerned. In rural districts, however, where families depend for their water supply upon wells, springs, or streams, and where sewage contamination is possible, such water may transmit the infection through the cysts being washed into the source of the supply, and the control of such conditions becomes a part of a control program.

The proper disposal of human feces is also an important part of a control program and should be carefully investigated in regions where amebiasis is common. The laws forbidding the use of human excrement for the fertilization of vegetable gardens should be strictly enforced, and if such laws do not exist they should be enacted and enforced. The use of the sanitary privy is just as important in the control of amebiasis in rural communities as in the control of hookworm or other parasitic infections, and the enforcement of laws or regulations regarding the sanitary privy and those forbidding indiscriminate defecation in the vicinity of human habitations, or near possible sources of a water supply, becomes a necessary and important part of a control program for amebiasis.

The prevention of fly breeding and the protection of food from flies should likewise form a part of the control program. It has been demonstrated beyond question that the cysts of *E. histolytica* may live in the intestinal tract of the fly for as long as 48 hours and that during this time the excrement of the fly contains viable cysts which may be deposited upon food, thus contaminating it and spreading amebic infection. In addition, flies may carry viable cysts of the ameba upon their feet and thus contaminate food should they walk over it in feeding. Cockroaches have also been found capable of transmitting the infection.

The detection of infected food handlers should form a part of any program for the control of amebic infection. Efforts have been made in some quarters to belittle the importance of infected food handlers in the transmission of amebiasis, but the fact remains that it is impossible to explain the transmission and the persistence of this infection in well sanitized districts in any other way, while the frequency with which familial infections with this parasite occur, in which the cook or other person preparing and handling the food for the family has been found to be a carrier, adds to the evidence of the importance of this method of transmission. Where there is an impounded, filtered water supply, where sewage is properly disposed, and where sanitary plumbing exists, the transmission of amebiasis must be almost entirely due to contamination of food and drink by food handlers infected with *E. histolytica*. If this were not true amebiasis would long ago have disappeared from our towns and cities.

It has been urged that the examination of food handlers for this parasite is not practicable because of the number of such individuals and the expense involved. It is very easy to recommend that all food handlers in our pub-

lic eating places and hotels be examined and those found infected with *E. histolytica* isolated and properly treated, but when one considers what is involved in such a recommendation when applied to a large city, it must be admitted that, while ideal, such a procedure would not be possible owing to the time involved; the great expense attending the examination and the treatment of the infected; and the loss of time and money to the infected individual and his employer. While all this is true, the examination of food handlers is practicable in many localities, owing to the small numbers involved, and certainly in our smaller villages and towns, it is feasible to examine all the food handlers in public eating places for this infection and to eliminate their infection by proper treatment. While it is best to forbid infected food handlers to pursue their occupation until their infections are eliminated, this is not absolutely essential, for the food handler may be given treatment while still pursuing his occupation, and he can be warned that he is a danger to others and instructed as to the precautions he may take which will prevent the transmission of amebiasis by himself while he is undergoing treatment. Likewise, if a case of amebiasis is discovered in a family, it is perfectly feasible to examine the other members of the family and, if any are found infected, to treat them. Certainly the control of amebiasis will be greatly assisted if as much as is possible is done in the way of the examination of food handlers and the treatment of those found infected.

The detection of carriers of *E. histolytica*, aside from those handling food should be included in a program for the control of amebiasis and as much should be accomplished along this line of attack as is possible. Owing to their great number it is obviously impossible to detect all carriers, as this

would entail the examination of the entire population of the country, but the laboratory examination of the feces of all individuals in families in which one member has been found infected, and of as many as possible of the population in localities where amebiasis is frequently encountered, or where numerous acute amebic infections are occurring, should be attempted by the health authorities. When funds and trained personnel are available surveys should be conducted to determine the incidence of amebic infection in regions where such infection is known to occur, or in other regions where it probably occurs, and infected individuals should be treated and instructed regarding the nature of the infection and the methods of transmission. The inmates of public institutions, such as hospitals, orphan asylums, insane asylums, etc., should be examined, as in such institutions the incidence of infection with *E. histolytica* is frequently excessive, especially in insane asylums.

What may be accomplished in the examination of a population for infection with *E. histolytica* is well illustrated by the results obtained by Seckinger (1936) who, in villages in rural Georgia, examined the members of 69 families, including 290 individuals, and found 162, or 55.09 per cent, infected. In several families the infection rate was found to be as high as 90 per cent, and in one family of 11 members, 10 were found positive. Of these, 1 suffered from dysentery at the time of examination, in 5 others symptoms of amebiasis were present, while in 4 there were no symptoms or history of symptoms.

I have endeavored to outline briefly the measures that should be included in a program for the control of amebiasis. The administrative details connected with such a program must, of course, be worked out by the city, county, and state health boards of the states in

which such a program is adopted; but it is believed that if proper coöperation is obtained between the organizations concerned, a program for the control of this infection is feasible and could be conducted without too great an expenditure of money.

Summarizing what should be included in a program for the control of amebiasis by health departments, such a program should include the following, to be participated in by city, county, and state health departments as the situation indicates:

1. Making amebiasis a reportable condition, using a nomenclature for reporting it similar to the one now recommended in the *Standard Classified Nomenclature of Disease*.

2. The training of a sufficient number of health laboratory workers in the recognition of *Endamoeba histolytica*, the cause of this infection.

3. The education of the public regarding the infection and its importance as a public health problem, by means of printed information, radio talks, etc.

4. A careful inspection of public buildings, hotels, restaurants, and other public eating places as to the presence of possible cross-connections in the plumbing system between sewers and the water supply.

5. The protection and sterilization of water supplies in rural districts and villages or towns where an impounded and filtered water supply is not available.

6. The proper disposal of human feces, and the enforcement of regulations regarding this matter.

7. The examination of food handlers for the detection of infected individuals and their proper treatment after detection, in so far as is possible with the facilities at hand.

8. The detection of carriers of *E. histolytica* by means of surveys of the population in localities where epidemics of amebiasis may occur or where it is believed that such infection is responsible for illness.

9. The prevention of fly breeding, and the protection of food and drink from flies and other insects, such as cockroaches.

Fortunately, most of the items included in this program are already taken care of by present regulations of our city, county, and state boards of health, and all that is needed is to enforce such regulations; but much remains to be done, so far as the control of amebiasis is concerned, in training personnel in the recognition of *E. histolytica*; in educating the public regarding the importance to health of infection with this parasite; and in the examination of food handlers and other individuals in localities where infection is known to exist or in others where it is suspected of being present. These are the most important parts of a control program and until something is done about them amebiasis will continue to be a public health menace in the United States.

REFERENCES

1. Craig, C. F. *Am. J. Trop. Med.*, 16, 15, 1936.
2. Seckinger, D. L. *South. Med. J.*, 29, 472, 1936.

National Health Survey

THE Division of Public Health Methods of the National Institute of Health, U. S. Public Health Service, Washington, D. C., released on January 17 preliminary reports of the National Health Survey of 1935-1936.

Bulletin No. 3 describes the findings regarding illness and medical care in relation to economic status.

This comprehensive survey was conducted by the U. S. Public Health

Service with the aid of financial grants from the WPA. These findings are based on a house-to-house canvass of some 800,000 families, including 2,800,000 persons in 84 cities and 23 rural areas of 19 states. The survey was made during the winter of 1935-1936, and the total survey population was so distributed as to give a sample representative of cities in the United States according to size and region.

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

February, 1938

Number 2

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

PUBLIC HEALTH EXPANDING

ONE does not have to watch the literature too attentively to discern a growing interest in public health and to detect the recognition by the profession that preventive medicine and public health are expanding—that constantly new items are entering into the practical field, and from the very nature of things are demanding more and more attention. For many years, and too much so even today, public health in the mind of the average person has been considered as referring chiefly to the infectious and contagious diseases. The medical profession has not yet gotten away from this idea entirely. It is true that even now this group of diseases causes more than half of all deaths and probably even a higher proportion of illness. We are constantly achieving triumphs in the prevention of preventable diseases the cause and manner of spread of which we know. We are even from the practical standpoint improving the outlook of certain other diseases; cancer for example, the cause of which we do not know, and which is certainly not contagious in the ordinary sense of the term.

Mental Hygiene—For several years we have had a group in our Association interested in mental hygiene, and some excellent papers have been given, most of which have found their way into our *Journal*. At our recent meeting the importance of this subject was stressed, and one thoughtful paper expressed the opinion that there was a distinct epidemiology of mental disease; another held it was a function of health departments; another spoke of the training of nurses in order to help mothers in the prevention of mental twists; while a fourth spoke of the achievements and possibilities. There can be no question of the importance of this subject. Since 1910 there has been an increase of 122 per cent in the number of patients in mental hospitals, although the population of the country during that time has grown only 40 per cent. Some of this increase in the number of patients is due to better facilities, to a partial overcoming of the idea that mental trouble is a disgrace, but there is some indication also that the actual number of mental cases is increasing.

The first child guidance clinic in this country was established in 1909, but for children and adults there are now 683 such clinics in the United States, and 53 in Canada, serving more than 12,000 new cases annually. So far it is difficult to evaluate the preventive effect of these clinics, but there is some evidence that they are doing much good.

During the past 6 years, some 36 medical schools in this country and Canada have introduced or improved their facilities for clinical instruction in psychiatry, the recognition of a need which was introduced to us largely less than 30 years ago, although insanity and other types of mental trouble have been with us throughout all time.

Accidents—Perhaps the next most urgent demand for consideration as belonging to public health is the matter of accidents, which have been grouped under the title, "External Causes of Death" in the *International List*. Such a prominent place has been taken by automobile accidents that most of us have almost forgotten that there are other causes of accidental death. For 1937, the number of deaths from automobile accidents is computed at approximately 37,000 and the number of injuries more or less severe at about one and a quarter million. For the last year in which we have accurate statistics, the death rate was 24,500 for persons 15-64 years of age, and 4,300 for children under 15. It is well said that "This wholesale slaughter is without parallel outside of America." America, of course, leads in this slaughter. Many factors are concerned in this question; mental capacity, habits, the use of alcohol, etc. Whether we wish it or not, the matter has been forced upon us as a public health problem.

On the other hand, railroad accidents have decreased and, as far as passengers are concerned, have almost vanished. Too many employees still meet with accidents and death. Indeed, some of the accidents such as those at grade crossings, for example, are generally due to the drivers of automobiles.

Suicide—Every year some 20,000 people in the United States commit suicide, meaning that of every 1,000 white males born, 18 will sooner or later take their own lives, against 5 for females. Again, many factors come in here, some of which belong distinctly under the public health aspects of mental hygiene. As Dublin and Lotka¹ express it, "Suicide is indicative of a badly integrated personality . . . the end result of personal maladjustment and frustration which can often be avoided were the individual in question helped, before it is too late, to solve his conflicts in a more constructive fashion."

Homicide is another cause of death which does not exercise us as a public health matter as much as it should. In a paper read before our Annual Meeting,² on October 6, 1937, it was clearly said, "Homicide is a preventable cause of death."

Space does not permit a discussion of the various other types of accidental death, such as falls, burns, firearms, mining, machines, electricity, poisonous gas, etc. It must be clearly pointed out, however, that all of these deeply concern the vital statistician, and vital statistics is the bookkeeping of public health. It is impossible to avoid the conclusion that some, if not all, of these matters deserve inclusion under the general title of public health.

Cancer—Cancer is definitely not contagious or infectious in the ordinary sense of these terms, yet it has always been a question which loomed large, and of necessity has engaged the attention of public health workers. Its apparent increase has led to considerable discussion. With the prolongation of the span

of life which has taken place chiefly through preventive measures in the early years, more people are reaching the age when cancer becomes more prevalent. From every standpoint cancer deserves to be considered a public health problem. While it is true that a large and well managed journal is devoted to this subject, and that there are a number of Funds devoted to the study of cancer from every aspect, the Annual Meetings of this Association should have more papers on cancer, discussing the advances made, our knowledge of it, and its prevention by such measures as are known to be effective.

Diabetes is another disease which is not contagious. It is attracting more attention each year, and papers have been given to us concerning it, one of which is now in preparation for publication.

Housing and Nutrition—In our sister country, England, housing and nutrition appear to be the two matters which are attracting the most attention. Both of them have unquestionably a tremendous effect upon the health of the public, to say nothing of our general well-being and efficiency. At our recent meeting, a symposium was presented on the Hygiene of Housing, which included, of course, heating, ventilation, lighting, etc. This will be published in the March issue. We can remember when the matter was taken up in this country largely by Mr. Veiller, in connection with tuberculosis, and a clear demonstration was given, especially for New York, of the bad effects of the tenement house system as it then existed, on the incidence of tuberculosis. Heating and ventilation engineers and architects have perforce continued some excellent studies, but discussions of these matters as public health problems have not been as active as they should have been.

This discussion has taken into consideration what seemed to be the most immediate and most urgent needs. Others could well be added. Several diseases which interest the vital statistician and the health officer and which have been in the past considered as non-contagious are now believed to be partly or in whole caused or aggravated by certain infections, obscure or otherwise.

The list of items heretofore and at present included under the general term of public health, has grown and must grow. The term might well be expanded to include all causes of disability and death other than those generally called—often mistakenly so—natural causes. Our Association has expanded from a comparatively small group made up of medical officers of health into an organization which now has 10 sections, with several others clamoring for admission. We believe that our organization must expand and that our official organ, the *American Journal of Public Health*, will have to expand along with the Association and the demands upon it.

REFERENCES

1. Many of the figures given have been taken from *Twenty-five Years of Health Progress*, by Dublin and Lotka, 1937.
2. Whitfield, R. N., M.D. The Homicide Situation in the United States. *A.J.P.H.*, Oct., 1937, p. 981.

AIR-BORNE INFECTION

IN the early days of bacteriology the air was regarded as being a frequent vehicle for carrying infection. As early as 1861, Pasteur demonstrated the presence of microorganisms in the air of various places, the number varying with the locality. Experiments were carried on by Lister, Tyndall, Miquel, and

others, and many will remember that one of the first publications on bacteriology in America was "Dust and Its Dangers." Lister guarded against the suspected dangers of air by operating under an antiseptic spray and covering the wound, after operation, with many layers of dressings. It was not very long, however, before experiments indicated that the air played a minor part in the infection of wounds, and attention was turned to cleanliness, sterilization, and antiseptics.

Nearly 25 years after the experiments of Lister and 10 years after those of Tyndall, Flügge, having failed to recover organisms from the mouth and nose on plates more than a few feet from the faces of persons coughing and sneezing, advanced the theory of "droplet infection." Observations such as those made at the Hospital of the Pasteur Institute, the Hôpital des Enfants Malades, and by Grancher, all in Paris, seemed to prove that infection through the air occurred in a minimum percentage of cases.* Belief in air-borne infection became practically eliminated, though there were always certain diseases, notably smallpox, measles, and influenza, that did not seem to fit into the prevailing ideas. Such terms as "volatile" and "diffusible" were applied to some viruses.

Articles on the subject appeared fairly often and experiments were carried on, especially concerning the possibility of the air-borne transmission of tuberculosis. Guinea pigs placed in the ventilating shafts of hospitals for consumptives became infected in some instances, but even when these animals were injected with dust collected in such shafts, positive results were surprisingly few (2.7 per cent of 74, London Hospital for Diseases of the Chest, Heron; 1 of 16, from a military hospital, Kirchner). Flügge had entirely negative results in experiments on guinea pigs exposed to the inhalation of such dust. Cornet, 1899, excited much interest when he demonstrated tubercle bacilli in dust from hospitals and private houses in which there were phthisical persons, and succeeded in infecting 46 of 48 guinea pigs by exposing them to dust grossly polluted with dried tuberculous sputum.

Again more than 25 years passed without very active studies of the question. Interest in the matter has been revived and a number of recent investigations have shown the existence of specific germs in the air of hospital wards. For example, the air in four scarlet fever wards was found to be heavily infected with the *Streptococcus pyogenes*, and in one the types corresponded to those found in the patients. The organisms were widely spread and the types identified were often found away from the vicinity of patients infected with these particular types.¹ At the National Institute of Health, psittacosis virus was apparently conveyed by the air from the basement to the upper floors.²

For some 5 years, studies on air-borne infection have been going on at Harvard.³ New methods and new apparatus have been designed.⁴ It has been shown that the droplets described by Flügge do not necessarily fall to the ground within a short distance. As their size becomes smaller by evaporation they fall more and more slowly, and finally become so minute that their behavior in air is comparable to particles of smoke rather than to the droplets described by

* At the Hospital of the Pasteur Institute the wards open into a common corridor. In $2\frac{1}{2}$ years 2,000 patients were treated, including 524 cases of smallpox, 443 diphtheria, 126 measles, 163 erysipelas, 92 scarlet fever, 166 non-diphtheritic sore throat. There were 6 cross-infections—4 smallpox and 2 erysipelas.

At the Hôpital des Enfants Malades the beds are separated by partitions. With 5,017 patients there were 7 cross-infections—6 measles and 1 diphtheria.

Grancher has two wards with no partitions, only wire screens as reminders to the nurses. In 10 years he had 115 cross-infections of measles—7 of scarlet fever and 1 diphtheria.

Flügge. In experimental apparatus it has been shown that they persist in diminishing numbers for hours and even days. The dried residues of these infected droplets, called "droplet nuclei," remain suspended for a long time, and may be carried long distances from their source. Droplet infection is essentially localized and concentrated, but that by droplet nuclei is more dispersed and dilute.

The viability of a number of the germs contained in these droplet nuclei has been determined. Generally speaking, 4 organisms characteristic of the upper respiratory tract—pneumococcus type I, *B. diphtheriae*, *Streptococcus haemolyticus* and *Streptococcus viridans*, are found decidedly more viable than the intestinal group of organisms, having been recovered after 2 days. Experimentally, *B. coli* put into the water of a 1 room air conditioner in the basement of the Harvard School of Public Health, which does not have mechanical ventilation, was recovered from the ends of every corridor of a 3 story building, showing that infected droplet nuclei can be dispersed by ventilating currents throughout a building.

The expulsion of infected droplet nuclei by sneezing has also been proved. Bacterial samples collected in the centrifuge³ on blood agar tubes showed thousands of alpha streptococci and *M. catarrhalis*. It is well known that the diseases spread by the upper respiratory tract and taken into the body through the same tract are those hardest to control. In 1933 more than 85 per cent of the deaths from infection and parasitic diseases in the United States were from diseases in which the usual portal of entry is the nasopharynx, and in the same year the incidence of measles was the highest of all diseases, while influenza came next. It is generally admitted that nasopharyngeal infection is practically universal.

Those who carried out the studies mentioned hold that the burden of proof of air-borne infection, which has until this time rested on bacteriology, has been lifted, and it is now necessary for epidemiology to disprove the fact of air-borne diseases.

It is evident that a reëxamination of some of our beliefs is necessary. It remains true that direct evidence of air-borne infection is, on the whole, lacking except in special cases. Without questioning the experimental data brought forward, which we believe to be of great importance, it seems that infection resulting in clinical disease would be more widely spread than is apparent. In 1918-1919, during the pandemic of influenza, one of the most contagious diseases, the percentage of the population affected was relatively small (11 per cent).

The experience of the English with "bed-isolation" wards indicates that they are as effective as cubicle isolation. In these wards a variety of diseases are treated side by side, though acute cases are separated by at least 12 feet, and strict "surgical asepsis" is insisted on. In the British Navy good results are believed to have been obtained in checking infection in meningitis by making the men lie alternately head to feet. Such facts point to the importance of direct contact rather than to the air as a vehicle.

Further investigation of this important problem will be welcome.

REFERENCES

1. *Bull. Hyg.*, XII, 6:417, 1937.
2. McCoy, G. W. *J. Infect. Dis.*, 55:156 (Sept.-Oct.), 1934.
3. Wells, William Firth, and Wells, Mildred Weeks. *J.A.M.A.*, 107, 21:1698, 1937.
4. Wells, W. F. *A.J.P.H.*, XXIII, 1:58 (Jan.), 1933.

DR. LAWRASON BROWN

THE death of Lawrason Brown on December 26, 1937, deserves more than passing notice. He was a Life Member and Fellow of this Association. Breaking down with tuberculosis when he was a medical student at Johns Hopkins Medical School, he spent most of the rest of his life at Saranac Lake where he was a student and assistant under the late Dr. Edward Trudeau.

He was a member of many learned societies. His bibliography was extensive, but perhaps his chief contribution was to *Osler's Modern Medicine*. Indeed, when this book was projected the publishers made a stipulation that the chapters on tuberculosis should be written by the men at Saranac Lake.

In addition to his specialty, Dr. Brown took a great deal of interest in public health generally, concerning himself over pure milk for his community, and if the writer's memory is correct, served for several years as Health Officer of Saranac. This *Journal* is indebted to him for a number of masterly reviews of books on tuberculosis. He had not only excellent training, but rare good judgment, and his judgment of books was sound always.

His personal character was most attractive. No one knows the many kindnesses he did more or less secretly, in which he followed the lead of the founder of Saranac Sanatorium, Dr. Edward Trudeau, who at the end of a day had often given away more money to patients than he had taken in. It is needless to add that Dr. Brown had hosts of friends in this country as well as in Europe who will mourn his loss not only personally, but as a master in his knowledge of tuberculosis. We extend to his wife and family our most heartfelt sympathy.

JOURNAL POLICY

IT is good business for an organization to take stock of itself now and then, especially a successful organization with no urgent reason for so doing. A degree of success sometimes acts as a sedative to initiative, instead of energizing directors and staff to greater aggressiveness and progress. When that happens the policy of *laissez faire* prevails, former perception of opportunities for expansion and profit, whether financial or professional, is dulled and eventually retrogression begins.

This philosophy of critical examination and appraisal of basic structure, of objectives, of enterprises and services, has served the American Public Health Association well. The attitude of its governing boards and of its members has always been that of a father of our acquaintance who examines the scholastic record of his honor-roll child every month with the comment, "Very good, but room for improvement." Such an attitude implies always that the ability to do better exists and that a little harder work, a bit more thought, a slight shift in emphasis will assure another advance.

Stock-taking of the standing committee organization of the Association last year led to the conclusion that, effective as the five committees had been, administration would be simplified if two—Fellowship and Membership, and Meetings and Publications—were dissolved. Accordingly, these committees were abolished and most of their responsibilities were centralized in the executive office. Celerity of decision and smoothness of operation have been immediate results. Two major duties of these committees required more formal treatment. The pre-

liminary passing upon qualifications of applicants for membership and fellowship, formerly the authority of the Committee on Fellowship and Membership, was placed in the hands of a new standing Committee on Eligibility. The *American Journal of Public Health*, previously under the jurisdiction of the Committee on Meetings and Publications, will in future be directed by an Editorial Board especially created for the purpose. Dr. Mazÿck P. Ravenel continues as Editor.

The *American Journal of Public Health* is a going concern. Under the editorship of the past fifteen years, it has shown a steady and healthy growth. It is regularly abstracted in the leading health journals in Europe and America. The circulation of this issue is the largest in its history—close to 8,000. There can be nothing very wrong with a magazine that holds its readers year after year and adds consistently to its circulation. Sustained reader-interest, to use the expression of the circulation manager, bestows the accolade of approval on any periodical, without benefit of scroll or testimonial. And sustained reader-interest is measured by nothing under the sun but a straight numerical count of subscription renewals. The *Journal's* record in this connection is the envy of more than one publisher we know.

The Editor, the Executive Board, the business office do not want to stand on records, however. "Very good, but room for improvement." Therefore, when the organization stock-taking made necessary a different division of publication responsibilities, it was welcomed as an opportunity to check up again on *Journal* direction and scope to make sure that no possibilities for usefulness to the public health profession were being overlooked. The Editorial Board had served long and well, but its 15 members were scattered geographically, making anything but communication by mail out of the question except at rare intervals. Some of the Editor's tasks were tedious, added to him by accretion rather than by purpose. Finally, after weeks of discussion, in which all concerned participated, a plan emerged which promises to be generally satisfactory. It involves an Editorial Board of five, all within easy access of the executive office, and consequently available for frequent consultation individually and collectively. The Chairman is the Executive Secretary, who also serves as Managing Editor, and the other members are: Prof. Ira V. Hiscock, Kenneth F. Maxcy, M.D., Arthur P. Miller, C.E., and Harry S. Mustard, M.D.

This group and the Editor will take the *American Journal of Public Health* as it now is and attempt to make it an even more effective instrument for the dissemination of authentic public health information, more thoroughly representative, if that is possible, of the interests now alive and those coming to birth in the public health profession. Before anything is done to effect what they all hope will be improvements, suggestions and comments from those whom the *Journal* is designed to serve will be most heartily welcomed.

WHAT WE OWE TO VETERINARY MEDICINE

THE December number of the *Journal of Comparative Pathology and Therapeutics*, founded by Sir John McFadyean, is dedicated in honor of its founder and editor, who is now 84, but still active physically and mentally. Five men of international reputation, contemporaries of Sir John, were asked to contribute short articles each from his own particular viewpoint in regard to the profession and Sir John's contributions. They include Bulloch of England, Leclainche of

France, von Ostertag, Schmaltz, and Mohler, Chief of our Bureau of Animal Industry. Americans, and especially the veterinary profession in America, owe much to Sir John.

There are few men who have covered so much ground and covered it so well as Sir John has. Not only has he devoted himself to pathology and therapeutics, as the title of the journal indicates, but he has written also on biochemistry, immunology, parasitology, and other subjects. He has studied anthrax, blackleg, cancer, glanders, hog cholera, epizootic abortion, pneumonia, tuberculosis, and other subjects, mainly from the animal standpoint. It is not too much to say that his studies and writings have guided much of the thought and work, especially among veterinarians, in the United States.

He has always paid particular attention to prophylactic measures. He was one of the earliest in the field of preventing contamination of milk by pathogenic organisms. Curiously enough, England is behind America and other parts of the world in the control of milk, in spite of the wonderful leadership she has had.

Sir John has done a great deal of work on animal tuberculosis and its relation to man. At the London Congress on Tuberculosis, following Koch's astounding claim of nontransmissibility from cattle to man, Sir John and the writer were selected to speak before the general meeting to combat the ideas advanced by Koch. Again, America leads in the eradication of bovine tuberculosis, due in this country almost entirely to the enlightened vision of Leonard Pearson, now carried on by our Bureau of Animal Industry under Mohler, but Pearson's plans were founded largely on the work and studies of Sir John. The studies of Sir John on glanders are generally credited as being responsible for the almost complete eradication of this disease from America.

The editor of this *Journal* has for years advocated a closer relationship between the veterinary and medical professions and has done as much as he could to bring more veterinarians into the American Public Health Association. At our recent meeting in New York we had a number of valuable papers from veterinarians. It is our hope that our relations will grow closer and closer because every year brings the proof of the close relationship between animal diseases and those of man.

We join with England in doing honor to Sir John and wishing for him many years of usefulness and happiness.

PUBLIC HEALTH EDUCATION*

Read It Before You Print It—What reads crystal clear to the writer may read quite differently to some other person. Of course the health officers were not responsible for the implication in this quotation from a New Jersey newspaper:

No explanation was given as to how the malady was introduced into the village, although it was said Federal and State health officers have visited the place.

To guard against double meanings, and other forms of confused writing, try to hold your copy on the desk for one day at least—a week is better. Then re-read it before putting it to use. Incidentally such a procedure would be likely to cut down the cost of “author’s corrections” of printed matter.

“Your Health” Broadcasts Continue—And it is not too late to consider their introduction into schools, or to take up the organization of listener groups of mothers, P.T.A. members, church or women’s club groups.

The program is broadcast every Wednesday from 2:00 to 2:30 P.M., eastern standard time, over Red network of NBC. For details about school or group use of the broadcasts write to Dr. W. W. Bauer, A.M.A., 535 N. Dearborn St., Chicago, Ill. Dr. Bauer will send a list of topics and of stations.

Health groups and others interested should prod the local stations so as to offset any possible commercial competition for the time.

How It Has Been Written—Probably some of our readers would like to consider varied forms for presenting a health message.

The first example is from New Mexico, a newspaper column written by Charles M. Cree, Director of Public Health Education in the State Bureau of Public Health:

It is funny	And when the
That some people	Doctor is finally
Who profess	Dragged in and
To love their	It is too late
Children	For him to
Will delay and	Help a great deal
Delay if one	The righteous
Of the family is	Parent will
Sick before	Claim the M.D.
They call in	Is a bum doctor.
The Doctor	Because he wants to
And sometimes	Shift the blame
It is so	From himself
Necessary for	At any cost
The Doctor to	So the poor
Come at once	Physician is often
I mean right now	Made the scapegoat
If he is to	For the parent's
Do any good	Foolishness

Expansion in Canada—At the 1937 meeting of Canadian Public Health Association one of the resolutions expressed

... its appreciation of the action of the Dominion Government in strengthening the Department of National Health by ... the restoration of the divisions of Publicity and Health Education, and Maternal and Child Welfare ...

“Musclebound with Caps” —“The Proofroom” is a valuable and definitely interesting department in *Inland Printer* (Chicago, Ill.), a leading journal of the printing industry. Recently a correspondent wrote about a bus card that

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Ewart G. Routzahn, 130 East 22d St., New York, N. Y.

... began about like this: "Abraham Lincoln, When President of the United States, Before The Day Of The Auto"—every single word starting with a capital letter. Would you call that a strong style?

Said Editor Teall in reply:

Decidedly not! It is weak—spotty, like a case of measles. The capitals lose their character when used so indiscriminately. They are like cusswords overdone. There is nothing weaker than "strong language" dished up too liberally.

Capitals are used to mark off the start of a new sentence, and for proper names and titles of respect. In headlines or any sort of display matter, they should be used sparingly, on main words only. On words like "and," "of," "the," they are completely out of place.

There is no inherent strength in capital letters. They are like italics, used for contrast; the capitals with lower-case, and the italics with Roman. Text all in caps is not strong; it is actually weaker than the combination of upper- and lower-case. Try covering half the line, and see how hard it is to "get."

The fewer capitals we use, the stronger are the ones we do employ.

Interpreting Your Illustrative Cases—To publicize health agency cases is a simpler job than to explain via case stories much of the work of family and child care agencies. But it is easy to get into the much quoted "rut"—presenting illustrative cases in routine fashion. Moreover some of the less tangible phases of health service fail to get into case stories. This is difficult writing.

"The Case Worker Interprets" is a mimeographed pamphlet reporting what 9 agencies or groups of agencies did toward better case presentation. Every division or bureau, or individual staff member who supplies case material, in addition to those who do the writing, speaking, or broadcasting, should be interested. Copies could be circulated. A staff meeting could discuss the projects to consider possible adoption of one of them. Several of the projects offer possibilities for joint participation by the local or state group

of health agencies. Joint study and participation with a group of family and child care agencies may be considered.

Get "The Case Worker Interprets" from Social Work Publicity Council, 130 E. 22d St., New York, N. Y. 25 cents; special rates for quantity lots.

Holiday Greetings—In Texas a holiday greeting sheet accompanied the regular mailing of *Bulletin* of the State Department. Printed in green, red, and black, with the face of Dr. Cox inside the wreath, and three paragraphs of which here is one:

It is impossible for me to write a personal letter of thanks to the thousands of Texans who have assisted the cause of public health during the past year. Please accept this substitute. I wish that I might take you by the hand and say "Thank You."

Ohio Public Health Association used a slip for envelope enclosure. Large size Christmas Seal, and "Merry Christmas and Happy New Year," with the name of the Association.

Connecticut State Department mimeographed a sheet bearing a typographical Christmas tree. The text started with these words:

Health is the supreme gift for 1938 which the State of Connecticut plans for all its citizens from the babe in arms to its oldest residents.

Next year when more of you may be sending greetings it may be well to remember that to get an interested reading you should not use all capital letters if your message includes more than a half dozen or so words. Some may wish to point out that many health gifts await the readers in the course of the year, subject only to their interest and care, and that the department or the association will continue to remind them of what is theirs for the taking; for others less fortunate, service will be rendered that they too may claim health gifts. Some may

choose to place emphasis in one direction. Connecticut singled out diphtheria and pneumonia.

Fifty years ago hearts were saddened in many homes throughout the state because 2,863 infants were missing from their Christmas festivities. This year the family circles are lacking only 770 infants, and 2,093 more infants are sharing in the Christmas fun than would have, had the health conditions of fifty years ago prevailed.

Health Education First by Television—"The first successful transmission of a public health message by television was made on Oct. 7, when the New York State Department through the coöperation of the National Broadcasting Company" gave a demonstration before a group of health authorities.

A sound motion picture, "Public Health in New York State," prepared by the department's Division of Public Health Education, was projected in the television room of the RCA building, and by means of special apparatus was viewed several floors away by invited guests. Addresses were given over the television system by Edward S. Godfrey, Jr., and Homer Folks . . . At the same time, the entire program was sent from the television transmitting tower on top of the Empire State Building for the general public within the receiving radius of the station.

Just as it was the first official body to use radio in broadcasting health programs, the department is the first health agency to send a motion picture film by television. In 1931 an attempt was made to send three of the department's animated health cartoons from a station in New Jersey to a receiving station outside of New York City, but was unsuccessful.

"Making Bibliographies Alive"—Public health workers have much use for reading lists or bibliographies. Life is too short, and publication is too diverse and too rapid to get along without them. But too many of such "helps" are hindrances, or at least offer little aid to the busy student or practitioner.

Several uses of bibliographies are

suggested by I. M. Cooper in *Special Libraries*:

The purpose may be fourfold: To educate those who know little or nothing of the subject; to incite further specialized interest and research among students, young or advanced; to create and promote general popular interest in historical, economic, technical, commercial phases of said subject; to encourage the intelligent workers themselves toward a realization of the wide importance of and diversified interests connected with their special job.

The actual examination of listed books is essential so that the titles may be "adequately annotated."

What does adequately, here, mean? It means putting oneself in the place of the prospective user of the bibliography and comprehending what he wishes to know, not what the annotator sees fit to let him know because of lack of imagination, vital interest, or printing funds. This does not mean writing an essay or being verbose; it means clear, strenuous thinking with the definite, objective service in mind. In the case of the kind of bibliography we have set out to compile it also means a flair for exciting interest in a way that will lead some to new fields and others to an enlargement of their specialization; at the same time meeting the approval of those already fully informed. Also from the point of view of the reference librarian, the research worker or the student, the annotations must prove the value of the whole as a tool in facilitating rapid service to inquirers with varying needs. What hours of futile expenditure of physical and mental energy would librarians be saved and what wear on nerves of waiting clients if annotations, when used, were adequately serviceable in eliminating material non-pertinent to the immediate call.

Not mentioned by the author, but a fair warning to our readers, is a reminder that the above is no job for a stenographer or an untrained student.

The bibliographer who wishes his tool to be "alive" cannot be a dead one himself. It is moreover necessary that he be an interpretative medium translating the material which he has brought together into a vitally important source of interest, refreshment, satisfactory verification, or detailed research.

From "One Way of Making Bib-

liographies Alive" in *Special Libraries*, 345 Hudson St., New York, N. Y. Dec., 1937. 50 cents.

Health in Newspapers: Part 3— We reproduce about half of one weekly release in the series called "Here and There With the Health Reporter." This is supplied free to newspapers by Edward Fisher Brown, Health News Service, 22 E. 40th St., New York, N. Y.

FOR RELEASE—Oct. 11th



Health Officials Meet

GATHERED together in their common fight to lower the death rate and promote the public health, prominent Health Officers from all over the country met in New York City last week. There was held the impressive 66th Annual Meeting of the American Public Health Association. Impressive because the program was fairly bristling with the names of nationally important health officials and because of the recognized importance of their common cause.

Notable, also, was the importance attached to the use of the proper food and a better knowledge of nutrition in improving general health. Special sessions were held each day for discussions on this subject by various Committees on Foods. That plenty of fresh milk, fruits and vegetables should be included in the daily diet of every human being in order to build good bodily vigor, was stressed over and over. Addition-

In Cities of 10,000 or More—The annual directory of "Health Officers in Cities of 10,000 or More Population, 1937," appeared in *Public Health Reports*, U. S. Public Health Service, Washington, D. C. Dec. 10, 1937.

A few of the larger cities reported their chief administrative officers, among whom we note the following:

Melvin P. Iseminger, M.D., Director, Public Health Instruction, Washington, D. C.

Dorothy Yoc Kalben, Director, Bureau of Health Information, Baltimore, Md.

Mary P. Connolly, Director, Division of Health Education, and Editor, *City Health*, Detroit, Mich.

Charles F. Bolduan, M.D., Director, Public Health Education, New York, N. Y.

Would not this annual directory be much more useful if all cities reported their staff members?

Anyway, dear Health Officers, won't you get the health education people into the picture?

A Week and Six Months—"Empire Health Week" (Oct. 3-9, 1937) was planned to be a particularly spectacular affair in England,

... for it has been selected for the opening of the national health campaign which is to be carried on by successive stages until next March. . . . The campaign is to be divided into 5 periods. October will be devoted to a general introduction to the campaign, the keywords of which will be "Towards a Fitter Britain—Use Your Health Services," which is an effective complement to the traditional Health Week Slogan, "Self Help in Health." November and December will be devoted to the maternity and child welfare services; January, 1938, to the school medical and dental services, and the milk-in-schools scheme; and February to the tuberculosis and other services for adolescents and adults. In March, 1938, there will be a link-up with the National Fitness Council, who will draw attention to the facilities already existing for physical training and recreation, and to the further facilities to be provided under the Physical Training and Recreation Act, 1937.

Throughout these months some millions of leaflets will be issued, and posters will be displayed by local authorities; a number of meetings will be organized by local authorities which will be addressed by members of all political parties, and other ancillary methods will be adopted such as the display of films of special health interest.

"Ask at the Post Office" will be one of the dominant slogans. Every post office will display a notice reading "Particulars can be ob-

tained at the counter about the health services in this district, including the addresses of the antenatal clinics and child welfare centres, and the times at which they are open." It is suggested that the "particulars" should take the form of a leaflet headed "Health Services," which could be handed to inquirers or shown to them, and which would contain details of local maternity and child welfare services referred to in the notice, information about such matters as the way to get an ambulance, the address of the local medical officer of health, the vaccination officer, etc., and the local hospitals, with their out-patient hours. A good selection of attractive outdoor and indoor posters, traffic cards for vehicles, book marks, mounted cards and folders, suitable to the special topic of each month of the campaign will be available for free distribution through the Central Council for Health Education.

From *Mother and Child*, 5, Tavistock Sq., London, W. C. 1, England. Oct., 1937. 9d.

Not Too Old to Learn—For workers in adult health education we quote some paragraphs from "Nisi Cresco," by William McAndrew. *Journal of Adult Education*, 60 E. 42d St., New York, N. Y. Oct., 1936. 75 cents.

Among those who have put life and hope into the service of adult education, I should like to sing a hymn of gratitude to Edward Thorndike.

Edward Thorndike is a prime antagonist of the old belief that we old chaps cannot learn anything. What he and his fellow workers have done is to overturn certain ancient proverbs of pessimism and despair. The Thorndikians have not denied the truth of the old adage that you cannot teach an old dog new tricks; they have doubted that an old man has to be considered a dog. By experiment and measurement they have shown that adults can learn anything they need to know. As I understand it, they have taken away from those who decline to exercise their minds the alibi of inability and have substituted the real reason, laziness. But laziness, as wise men from the time of Socrates have preached, is curable. The sovereign remedy for dislike of work is work.

From under Columbia University's dome, the same roof that shelters Thorndike, Walter

Pitkin issues his joyful gospel: "Life Begins at Forty." It does, says Walter, if you make it. It seems to me that the proper line for us teachers of adults to take is in this direction:

"How old are you, sir?"

"Sixty."

"Good! Life begins at sixty."

"What's your age, my good woman?"

"Seventy-three."

"Fine! Life begins at seventy-three."

Who can deny that life begins with every day on which one learns something worth knowing? Who can deny that every day one can, by intending his mind to it, as Sir Isaac Newton says, learn something worth knowing?

Jeremiah Jenks, reviewing the careers of Benjamin Franklin, John Quincy Adams, Abraham Lincoln, and many others, was moved to conclude that the best years of a man's life are the last ten years. And each of us, be it noted, is living in the last ten years of his life so far.

This idea gives a needful punch to the work of adult educationists who have to contend with the suggestion, prompted by indolence, that it is too late in the afternoon to begin anything.

The remainder of the article makes the application to the educators themselves! Some time we may quote those paragraphs.

Something Has Been Started—At least we hope so. Last October the A.P.H.A. had its first "hobby show" for members, with the prospect of repeats at future annual meetings.

Now the New York City Department of Health has put on its first hobby show as a phase of morale building. The first announcement listed 23 entrants, and invited all to—

See how your fellow-workers spend their spare time. See samples of their fascinating collections and products. Most of the entrants will be present—and will tell you all about their hobbies at the slightest hint.

Drama and News by Radio—During the spring of 1937, as a part of its health education program,

... the New Haven Health Department sponsored a series of radio presentations

through the facilities of Station WICC from its New Haven studios. These broadcasts, in the form of sketches, blending the historical with the present, dealt with a variety of public health topics. Many staff members of the department as well as specialists from outside the department, participated. Among the titles of the broadcasts were "Fifty Years Ago—An early meeting of the New Haven Board of Health," "Milestones of Health," "The Story of Vaccination," "The Conquest of Diphtheria," "Stars Along New Haven's Milky Way—the Story of Pure Milk," "The Foe of Youth—Tuberculosis," "A Perfect 32—Dental Hygiene," "Pneumonia Control," "Public Health Nursing." These programs were presented at an early evening period of 15 minutes each Friday night.

The current series of radio programs began in October 1937, at 4:30 to 4:45 Friday afternoons.

The title of this broadcast is "Health—Here, There, and Everywhere." An attempt has been made to present up-to-the-minute news and comment in the broad field of public health. The material has been compiled from public health reports, medical reprints, and the daily and weekly press, edited by Paul H. Stevens, the department's Public Information Assistant, and presented in chatty items by the Health Officer and members of the department's staff.

We quote 2 of the 7 examples of these items as reported in *Health* (Dec., 1937), issued by the department:

We wonder if any of you listeners have ever heard of lipid pneumonia? That's a funny name. Well, lipid in medical parlance means fat. From many sources cases of fat pneumonia have been reported, usually in infants and children under 2 years. And what do you suppose has been the cause of most of these cases? Nose drops—oily nose drops. The common use of the oil nose drops in young children has been found to be dangerous because in the usual struggle while the medication is being applied to the youngster's nose some of the substance is sucked into the lung. When once the microscopic feather cells lining these air passages are soaked with oil they cannot function. The function of these lining cells is to remove foreign particles and prevent material from gaining entrance to the lung. The oil, once in the lung, acts as an irritant and starts up an inflammatory process ending in a serious long-drawn-out type of pneumonia. So you see, oil drops should only be

used in children under the direction of a physician. Avoidance of self-medication is one of the first principles of good health.

Do you know that some people still wear a bag of camphor around their necks every winter? Why do you suppose they do it? Here's why. Because of a superstitious belief that it will prevent pneumonia and influenza. This practice of wearing a camphor bag around the neck, of course, does nothing of the kind. The only way so far, of preventing these maladies, is by staying away from people who have colds and by building up our bodily resistance. Milk, fruits, and vegetables, along with sufficient rest, will do much toward building that resistance.

Health Clubs for Negro Women
—As reported in *Health Bulletin*, Virginia Dept. of Health:

Health clubs for Negro women are organized by the department for educational purposes. Since October, 1932, clubs have been organized in 32 counties. The Negro Supervisors of Schools in these jurisdictions arrange meetings at central points for mothers, midwives, and others interested in health activities.

Mrs. Emily W. Bennett, R.N., of the department's Bureau of Child Health, gives a series of talks and demonstrations to the various groups. The members take The Healthy Baby course. Certificates are awarded by the Negro Organization Society to those completing it. In addition, club members make baby layettes, arrange for toxoid clinics, screen homes, and provide hot school lunches.

As it is impossible for the supervising field nurse to work in new counties and at the same time supervise the clubs organized two or three years ago, it is being advised that such organizations become a part of the school league. By this arrangement, it is hoped that the work will develop and become permanent.

Again Education Is Needed—
Dr. Ronald Hare, University of Toronto, writes of "Puerperal Sepsis and Its Prevention" in *Canadian Public Health Journal*, 105 Bond St., Toronto, Ont. Dec., 1937. 35 cents. In conclusion Dr. Hare says, as to one phase of the problem, that

... much may be done by an educational

program comprising the following points:

1. Better education for students and nurses in the technic of delivery in homes and difficult surroundings, as well as in the knowledge of etiology of infections which is now available.

2. Education of physicians already in practice by lectures, demonstrations, and refresher courses.

3. Education of hospital matrons and nursing superintendents in the part they should play in the elimination of infections from hospitals by control of carriers and infections among the nursing personnel.

4. Education of the public to take advantage of the facilities for antenatal examination now available and in the preventable dangers attendant on midwifery in the home.

5. Education of legislatures in the necessity for the provision of funds for the delivery of necessitous mothers, for skilled obstetrical assistance in case of need, and for the isolation and care of infected cases.

Eleven Slogans—Here are rallying cries for the successive early diagnosis campaigns:

1928—You May Have Tuberculosis—Let Your Doctor Decide; 1929—Early Discovery—Early Recovery; 1930—Protect Them from Tuberculosis; 1931—Tuberculosis—The Foe of Youth; 1932—Tuberculosis Causes Tuberculosis—Every Case Comes from Another; 1933—From Whom Did He Get It? To Whom Did He Give It?; 1934—Tuberculosis Robs You—Public Health Protects You; 1935—Fight Tuberculosis with Modern Weapons; 1936—Fight Tuberculosis with Modern Weapons; 1937—Uncover Tuberculosis by Modern Methods; 1938—Tuberculosis Undiscovered Endangers You.

Learning Versus Teaching—Reviewing "Advances in Public Health Nursing," Elizabeth G. Fox, said:

As for health education, so-called, we are beginning to have some insight into how to make the message of scientific medicine mean something vital to the individual. We have been called health messengers; and in that guise have naively thought that we could carry nuggets of science from the laboratory and deposit them on the doorsteps of the people, and that good results would follow. We were blind to the truth of John Dewey's statement that no more is something taught when nothing is learned than is something sold when nothing is bought. We thought

that the factors of interest and of voluntary activity, without which teaching is worthless, could be aroused through reason. We tried to make up by vehemence and persistence for what we lacked in insight, and when we failed we wrote our patient down as uncoöperative. More recently we have realized that getting people to adopt new ways is a science based on an understanding of the psychic drives which govern behavior. Even so simple a thing as getting a prejudiced mother to believe that pasteurized milk is safest for her baby may call for something much more subtle than a rehearsal of scientific evidence.

This is not to say that nurses have not been successful in the past in overcoming resistance. The wonder is rather that we have been so often successful. But candor compels us to admit that we have also been baffled time and again and have laid our failure to the contrariness of human nature. Now we are beginning to see that had we understood human nature better we might have discovered the cause of the seeming contrariness and have made our assistance acceptable to the patient.

In short, public health nursing has advanced to the stage of knowing that it is not enough to be a messenger conveying a standard package which we have selected in advance as good for any recipient. We must have our goods in a variety of forms and wrappings, and our methods of delivery must be as various as are the people with whom we are trying to establish fruitful relations. The prospective recipient's own plans and desires and interests must be our guide.

In *A.J.P.H.* and *Public Health Nursing*, 50 W. 50th St., New York, N. Y. Dec., 1937. 35 cents.

Leadership in the Berkshires—As reported in *Bulletin*, Massachusetts Society for Social Hygiene, Little Bldg., Boston, Mass. (Dec., 1937):

Under the chairmanship of Dr. Modestino Criscitiello, and with the active coöperation of the *Berkshire Evening Eagle*, the Berkshire District Medical Society, the local Health Department and the Pittsfield Council of Social Agencies, the committee has sponsored a series of 6 newspaper articles, which were given prominent space in the *Eagle*. These excellent articles were prepared by Dr. Willys Monroe, Pittsfield's Health Officer, Viola Vreeland, R.N., of the House of Mercy Hospital, and a Pittsfield physician, whose sense of

professional ethics constrained him to remain anonymous.

This project illustrates what a voluntary agency can do most effectively in a community. Pittsfield has made use of the machinery at its disposal to educate the general public on the subject of syphilis—its medical, public health, and social aspects.

Hygeia, January, 1938—Some of the articles in *Hygeia*, 535 N. Dearborn St., Chicago, Ill.:

New Year's resolutions . . . Preventing heart attacks (radio address) . . . Sex education for young children ("folly of fables and wisdom of truth") . . . Why condition the air? . . . These teeth of mine (teeth of savages) . . . The making and unmaking of a quack . . . "Occupational diseases" in children . . . Government's interest in violent and sudden death . . . Overcoming worry (habit control) . . . Occupational diseases of musicians . . . Some obesity "cures" and "treatments" . . . Two common intestinal worms . . . Diseases of the eye . . . New books on health . . . Questions and answers.

Under "School and Health":

The classroom teacher at work . . . Health teaching in January . . . Hygiene and the use of the dictionary . . . Everyday health lessons in a rural school (San Luis Obispo, Calif.) . . . How shall we teach safety to children? . . . New health books for teachers and pupils.

Tell the Public What You Do—
Ohio Health News, Columbus, Ohio, quotes the newspaper clipping below from Dr. J. A. Carter, Health Commissioner, Batavia, Ohio. The *News* suggests that such information is well worth printing in local newspapers. (It should be offered to the editors in the form of an interview with the health officer.)

The Clermont County District Health Department exists for the sole purpose of rendering service to the people of the county in matters pertaining to their health and welfare. All of its services are free of charge to rich and poor alike. In so far as it is physically possible for the staff to do so, every request for service is given prompt consideration. No requests for bedside nursing or for private medical care can be complied with. Certain of these services are

rendered in coöperation with the family physician.

For general information there are listed below some of the services to which residents of Clermont County are entitled and which will be rendered on request. Home visits by the nurses to any case of tuberculosis. Home visits by the nurses to any expectant mother, when requested by the family doctor. Home visits by the nurses to any crippled child. Home visits by the nurses whenever the health of any infant makes this desirable to the family doctor. Certificates showing official registration of birth for every child whose birth is reported. Assistance rendered anyone in Clermont County who desires a birth certificate. Diphtheria antitoxin supplied free to any physician in the county. Smallpox vaccine virus supplied to any physician in the county. Laboratory examinations where requested by the family physician. Investigation of every reported case of communicable disease. Investigation of well water for any resident. Investigation of every complaint of nuisance. Coöperation with milk producers to provide clean milk. Consultation regarding any matter of sanitation. Coöperation with P.T.A.'s and schools to provide physical examination of children before entering school. Follow-up to aid in obtaining correction of defects found in pre-school round-up. Immunization of school children against diphtheria and smallpox, where consent is given by parents. Examination of sight and hearing of school children. Physical inspection of all school children that time will permit. Inspection of school children at time of threatened epidemic.

DATES AHEAD

The "Little Red" one room cottage sanatorium was opened in February, 1885.

The first hospital in the modern sense of the word was opened in February, 1752.

Daniel Boone was born Feb. 11, 1735.

St. Valentine's Day comes Feb. 14.

And George Washington's birth makes February ever to be remembered.

The first visiting nurse went on duty in March, 1877.

St. Patrick's Day, March 17, has some health significance.

Spring begins March 21.

National Negro Health Week is announced for March 27–April 2.

April Fool's day, April 1, may be a time for telling how people fool themselves—with many health superstitions.

And then the Early Diagnosis Campaign is on throughout the country.

Details about the unfamiliar dates noted above would be found in "News Almanac" and "Almanac Notebook" issued by Community Chests and Councils, Inc., 155 E. 44th St., New York, N. Y. 50 cents.

COMMERCIAL GADGETS

"Debunker" is a handy device for still and motion photography. Two revolving circles in a 2½" by 5" card give quickly exposure time, etc., for motion, indoor, and outdoor pictures. Price 50 cents, but Don Graf, 330 W. 42d St., New York, N. Y., will send it, you to pay, or return.

With the increasing use of planograph and offset, consideration may well be given to special devices for making the most of the processes at the least expense. One of these is "Fototype," card board letters of standard type faces, for the easy production of headlines, captions, and text set in not smaller than 12 point type. A composing stick costs \$2.50, the letters about 5 for one cent. Any office worker can set the type, which is then pasted on the sheet with other copy. Address: Fototype Co., 629 Washington Blvd., Chicago, Ill.

If you have letter size, or smaller, sheets you wish duplicated in photostat style, the "Foto-Copyer" is offered by Duplico Corp., 28 East 22d St., New York, N. Y. Birth certificates, statistics, copies of any manuscript or printed material desired for reference, or to pass on for examination may be produced by a clerical worker at a cost of 7 cents a page for the paper. A substantial copy of a draft of the annual report could be made for gen-

eral scrutiny. Dr. Bauer in Health Education for Adults has in mind the desirability of such copies when submitting important manuscript to editors or publishers.

MAGAZINE ARTICLES

Articles are listed here for personal reading, office memoranda, bulletin boards, house organs, the writing of letters to the editors, etc.

"Angel in Furs," by W. B. Courtney. *Colliers*. Nov. 26, 1937. "They call Mildred Keaton a traveling nurse. She travels by dog sled, by airplane, and by kayak." "Keaton," say the people of Nome, "is the most beloved woman in Alaska."

"Get Its Number," by L. I. Dublin. *Colliers*. Dec. 11, 1937. "Not long ago doctors had to stand by almost helplessly when pneumonia struck. Now it's different. Science is now fighting *B. Pneumococcus* with the test tube."

"The Government Crusades for Good Health," by Dr. Thomas H. Parran. *Democratic Digest*, Women's Division of Democratic National Committee, National Press Bldg., Washington, D. C. Dec., 1937. 10 cents.

"Health to All of Us." Editorial. *Colliers*. Nov. 27, 1937. Health education, better living conditions, and better health for all.

"Knockout Drops—New Style," by H. Lees. *Colliers*. Nov. 20, 1937. "Ether took the physical pain out of operations: a new batch of anesthetics spare the patient mental distress as well."

"Organized Medicine 'Sees Red,'" by James Rorty. Doctors object to group medical service in Washington, D. C. *Nation*, 20 Vesey St., New York, N. Y. Nov. 6, 1937. 15 cents.

"Political Surgery." Editorial. *Nation*. Dec. 11, 1937. 15 cents. What happened to the \$100,000 medical-economic survey in California.

"Why Do They Die?" by E. Keating. *Literary Digest*, 233 4th Ave., New York, N. Y. Jan. 15, 1938. 10 cents. Why babies and mothers die, and what is being done about it.

MOTION PICTURES

"Descriptive List of Eastman Classroom Films." There are now 39 pictures described briefly under "Health" in this catalogue. Eastman Kodak Co., Teaching Films Division, Rochester, N. Y. *Free*.

"Indoor Movie Making" is a mimeographed pamphlet. Bell and Howell, 1801 Larchmont Ave., Chicago, Ill. *Free*. Part is general, part is given in terms of Filmo cameras.

A summary of important fundamentals of indoor movie making with artificial lighting. Important differences in lighting practice for black and white, and color photography are considered and tabulated in chart form.

In Sept., 1937, an injunction was granted in Detroit which prohibited the police from interfering with a performance of "Damaged Lives."

"For All Our Sakes" is a detailed scenario of the talking slide film of that name, together with information for its projection by one of the talking slide projectors which is quite different from the stereopticon. Am. Social Hygiene Assn., 50 W. 50th St., New York, N. Y. 24 pages. 10 cents.

"Let's Open Our Eyes." One reel film dealing with syphilis. 1,000 feet. 15 minutes. 35mm., also 16mm. National Motion Pictures Co., Mooresville, Ind.

The film points out that closing our eyes to the seriousness of the problem does not prevent the danger from existing none the less. It advises those who know they have become infected to go to a competent doctor or clinic at once. Faithfulness to the treatment schedule is stressed. The film also advocates routine Wassermann's for pregnant women and in all physical examinations. It closes with the message that syphilis can be controlled by energy, organization, and intelligent coöperation.

"Life Saving" is a new 2 reel sound picture (35mm and 16mm) issued by the Dept. of Agriculture, Washington, D. C. If not familiar with the distribution methods of the department it would be well to write for information.

"Your Health Department and What It Means to You." 2 reels. 35 mm. and 16mm. 2,000 feet. 30 minutes. National Motion Pictures Co., Mooresville, Ind.

It is the purpose of this film to show the public the activities, accomplishments, and goals of health department programs, thereby creating the essential coöperation and support of the public. Incidentally, it teaches many valuable health lessons, thus accomplishing a dual purpose.

NEW

New to us is *Bulletin*, Belmont Health Department. What state, you ask? There are 20 to choose from, but in the A.P.H.A. membership list we traced the name of the health officer named on the first page. *This* Belmont is in Massachusetts.

Canada's Health News, Health League of Canada, 105 Bond St., Toronto, Ont. A news bulletin supplementing the magazine, *Health*, the two issued alternately.

RADIO

"Keeping Well." The second series of radio talks broadcast by Baltimore Health Dept. and Medical and Surgical Faculty of Maryland; 145 talks or dialogues; 280 page paper bound book, with contents and index. 50 cents.

"Radio Broadcasting Stations of the United States." List of all stations; map (with time divisions) showing 138 NBC network stations. National Broadcasting Co., Rockefeller Plaza, New York, N. Y. *Free*.

"The Dentist Says" is a non-commercial program of dental health education via broadcasts from several

stations, together with a teaching plan book, and weekly copies of the broadcasts. The story form is used. Tuesdays as travelogues, Fridays as personal experience stories. The latest information is that the series is being broadcast over WMCA, New York; WIP, Philadelphia; WFBM, Indianapolis; WBAA, West Lafayette, Ind. For samples and full particulars address Dr. George W. Clapp, 220 W. 42d St., New York, N. Y.

A broadcast on venereal diseases was given over Station WRVA, Richmond, Va., as a feature of 1937 National Negro Health Week. The speaker was Dr. D. Webster Davis, Jr., of the Richmond Medical Society. In *National Negro Health News*, U. S. Public Health Service, Washington, D. C. July-Sept., 1937. Reports of the Health Week mention 327 radio talks in various cities.

"Getting Ready for School" is a dialogue on school health education. A paragraph from the announcer's statement:

We take you into the Home Bureau office where Mrs. Brown, President of the Home and School Club at Cramer's Corners, and also member of the Home Bureau, is waiting for Mrs. Graham, the Home Demonstration Agent. Mrs. Brown has 3 children, 2 in school and 1 just starting this year. Miss Grout, Consultant in School Health Education (Cattaraugus County) comes into the office, also to see Mrs. Graham, and sits down next to Mrs. Brown. Presently they begin to talk." (The conversation which follows interweaves facts about school child health conditions, and the program of Cattaraugus County school health service.)

The Health League of Canada (105 Bond St., Toronto, Ont.) has had the coöperation of 35 broadcasting stations in giving a weekly 15 minute health talk. The December and January topics included:

Cod liver oil . . . When to call the doctor . . . Diphtheria . . . Health insurance . . . Tuberculosis . . . The school child . . .

Typhoid fever . . . Results of milk pasteurization.

In a series on "Programs That Have Made Station History" we learn about Dr. Carlton's health talks. *Radio Daily*, 1501 Broadway, New York, N. Y. (June 7, 1937; 5 cents), says:

On May 31, WSJS, Winston-Salem, N. C., celebrated the seventh anniversary of its oldest continuous program. Every Monday evening at 8 o'clock since June 1, 1930, Dr. R. L. Carlton, head of Winston-Salem's City Health Department, has brought to the community a personal message on the subject of individual and public health or has presented some outstanding figure in the field. The program on May 31 was his 364th.

One of the principal reasons for the ever-increasing success and influence of the health program is the fact that Norris O'Neil, general manager of WSJS, has never exercised censorship on the doctor's remarks, believing that the station's audience has a right to hear frank discussions of any and all health problems, and that radio is the best means of bringing these discussions to it.

All opportunities to sponsor the program are turned down. Dr. Carlton's Health Talks are strictly a public service.

A personal experience in dealing with the "censor" of a national broadcasting chain is related in "What Can You Stomach?" in *The New Yorker*, 25 W. 43d St., New York, N. Y. Oct. 9, 1937. 15 cents. Written by an Associate Professor of Clinical Orthopedic Surgery at Columbia, Dr. Armitage Whitman. In view of the recent Mae West incident it would seem that doctors are more suspect than actresses with a reputation. Sample:

"No, Doctor, you can't say 'body' of the patient. 'Body' sounds like a 'dead body.'"

So far this department of the *Journal* has heard of no audience-protests against the use of syphilis or venereal diseases in any of many broadcasts over the country. On the other hand, one of the early December commercial programs brought out "a flood of protests." The skit was characterized as "obscene," "indecent," "vulgar,"

"filthy," "sexy," and so on. Apparently the "good taste" barrier so often urged by the chains as barring mention of syphilis did not hang very high for a commercial.

"A Well Person is a Community Asset. A Sick Person is a Community Liability." This heads a placard poster announcing weekly broadcasts over 5 local stations. Community Chest, Los Angeles, Calif. Also another: "Guard Your Health," "See Your Doctor While You're Well" with announcement of a weekly broadcast, "Heartbeats of the City."

"What's Wrong with This Radio Talk?" headed a short broadcast, announcer and director of a public health nursing service being the participants. On another page were given 8 corrections, including a sample story presenting the essential information in the uncorrected statement. Worth looking up. *Public Health Nursing*, 50 W. 50th St., New York, N. Y. Aug., 1937. 35 cents.

EXHIBITS

As reported in *Journal of Home Economics*:

Much interest was shown at the Eastern States Exposition in the Connecticut 4-H exhibit on home care of the sick in which simple homemade comforts were featured. The wheel chair improvised from a rocker on roller skates frequently brought the ejaculation, "Now, who ever thought of that?"

"J. R. C. Booth at the South-eastern Fair," by B. Worthen, in *Junior Red Cross Journal*, Washington, D. C. (Jan., 1938), tells how a group of Red Cross Juniors con-

structed and managed a display at a fair. Since health is so large a share of the Junior program, this article prompts us to suggest that the juniors might put on health displays at other fairs, if the idea was brought to their attention.

"The Paris International Exposition," by L. Taylor. *Trained Nurse and Hospital Review*, 468 4th Ave., New York, N. Y. Nov., 1937. 20 cents. Brief description of the "Palace of Discovery," part of which

... might have been built for the special interest of the nurse, so thorough and interesting is the section which deals with the history of medicine.

The whole job of "Organizing Educational Exhibits" for convention displays is described under that title in *Journal of Health and Physical Education*, Ann Arbor, Mich., Oct., 1937.

An actually satisfying holder for card signs and placards, to hold them upright on desk or table, in window or elsewhere, is "klikeasel," a simple device at \$1.25 for 12, using 2 to a card or sign. Obtain from local window display house, or Window Advertising, 175 5th Ave., New York, N. Y.

For window display and other exhibit planners corrugated paper in a wide range of color, texture, and design is available through Dennison Mfg. Co., Framingham, Mass., and Window Advertising, 175 5th Ave., New York, N. Y. Each offers a line with distinctive qualities, each has additional materials for display purposes, and also makes letters cut from corrugated paper.

BOOKS AND REPORTS

Public Medical Services. A survey of tax-supported medical care in the United States—By *Michael M. Davis*. Chicago: University of Chicago Press, 1937. 170 pp. Price, \$1.50.

In introducing this small but compactly written volume, Mr. Davis first of all paints a useful historical background in which he emphasizes the initiation of public medical services as a part of relief activities for the indigent, and later brings out the way in which the picture has been modified by a quite different motivation—a desire to meet broad community needs primarily in the public interest rather than the emergency needs of an individual. The hospitalization of mental diseases and of tuberculosis and the provision of clinics for the treatment of syphilis are obvious examples of the later tendency.

Mr. Davis reviews existing provisions for home and hospital care of various types at direct government expense and also the indirect support of voluntary institutions through financial grants. In an interesting table reviewing statistics for the year 1929, he estimates that of the total medical bill of \$3,600,000,000, \$2,830,000,000 were paid in fees, \$500,000,000 by taxation, \$170,000,000 by insurance, and \$100,000,000 by charity. Thus two-thirds of the cost of medical care was still borne by individuals on a fee basis, and of the remainder the major part by taxes. The book closes with an interesting consideration of quality of service and of the importance of community coördination. The author wisely emphasizes the importance of systematic pro-

fessional supervision of professional work which, while not always present in public medical services, is obviously much more effective there than in individualistic private practice.

C.-E. A. WINSLOW

Phenomenon of Local Tissue Reactivity and Its Immunological, Pathological and Clinical Significance—By *Gregory Schwartzman, M.D.* New York: Hoeber, 1937. 461 pp., 67 ill. Price, \$7.50.

The phenomenon of local skin reactivity, more commonly known as the "Schwartzman Phenomenon," was first observed by the author of this volume in September, 1927 (*Proc. Exper. Biol. & Med.* 26:207, 1928), in the course of his attempts to gain a more accurate understanding of factors and mechanism responsible for the systemic intoxications of infectious diseases. In order to overcome a hypothetical refractory condition of the animal cells, culture filtrates were given to rabbits by different routes on consecutive days.

When typhoid bacillus culture filtrate was injected intracutaneously and 24 hours later another dose was given intravenously a hitherto undiscovered local reaction occurred. Approximately 2 hours after the intravenous injection a blue discoloration appeared at the site of the skin injections made the day before. The discoloration rapidly increased so that within 4 hours the areas were dark blue in the center with a deep red zone at the periphery. The reaction reached its maximum size in about 5 hours when it was hemorrhagic and necrotic; sloughs formed about 48 hours after the intravenous injection;

these were followed by scab formation with healing in about 8 days. The appearance of a reaction 4 hours after the intravenous injection is illustrated by a colored photograph reproduced as the frontispiece.

Jules Bordet has written a foreword for the volume. In it he says:

The remarkable phenomenon which Dr. Schwartzman has studied with such ingenuity and perseverance has aroused the most vivid interest among bacteriologists and immunologists. From the very beginning his discovery has been justly recognized as an important scientific development. The discovery of the phenomenon was totally unexpected, it must be acknowledged, for if there is any field which has been minutely investigated from every point of view and conscientiously searched it is that of the reactions of the organism to bacterial products. One could not have suspected that in this field secrets still remained unraveled and surprises were in store for us.

The Schwartzman phenomenon, Professor Bordet suggests, is closely related to the phenomenon of Sanarelli. He states that:

Dr. Sanarelli had shown that an intravenous injection of *B. coli* culture filtrate, although easily tolerated by the control animals, elicits a fatal hemorrhagic congestion in the intestinal tract of rabbits which had previously received a sub-lethal dose of cholera vibrio. . . . It is highly probable that these phenomena determine the pathogenesis of certain complications in the course of infections.

This volume consists of 13 chapters. The first deals with basic matters such as terminology, general considerations, and quantitative estimations of potency of active principles. The second discusses bacterial filtrates and other products capable of eliciting the phenomenon; the third concerns physico-chemical properties. Subsequent chapters consider, interestingly and thoroughly, immunological behavior of active principles; immunity to the phenomenon; rôle of inflammation; methods of elicitation; reactivity of

malignant neoplasms; reacting potency of non-bacterial substances, nature of the active principles; immunological relationships of the phenomenon (in this it is shown that the phenomenon is not related to allergy); immunological, pathological, and clinical significance; and application to treatment of certain human conditions.

The material constituting each of the chapters is well systematized and each ends with a recapitulation. This method of presentation greatly facilitates reference and study.

The final chapter upon the application of the phenomenon to treatment of certain human conditions reveals how little of practical value to the clinician has resulted from recorded investigations in 10 years. Like the bacteriophage, the Schwartzman phenomenon holds intense interest for the research worker and its study is full of promise. The phenomenon offers an explanation for certain phases in the development of disease processes for which there has been up to now no lucid understanding. The author's conclusions as to the nature of the phenomenon are

. . . that the state of reactivity described deals with a hitherto unrecognized functional disturbance in the susceptibility of the animal tissue elicited by means of certain bacterial active principles and that the phenomenon of local tissue reactivity displays a mechanism whereby injury may be produced through the synergistic effect of bacteria and their products and also through the concerted effect of bacteria and their products and nonrelated anaphylactic processes.

Immunologists, and clinicians, too, will be glad to have assembled in one place the hitherto scattered mass of information already accumulated upon the Schwartzman phenomenon. For a great preponderance of the ingenious, painstaking, and illuminating work recorded herein the author is himself responsible.

The volume contains an ample bibliography (from which the titles of cited papers are omitted), an author index, and a subject index. It is an attractive addition to our libraries; the very name of its publisher is well known to be synonymous with superlative in the book making art. It constitutes another fine memorial to his high ideals.

A. P. HITCHENS

Pathology (Clio Medica)—By E. B. Krumbhaar, M.D. New York: Hoeber, 1937. 206 pp. Price, \$2.00.

The author has compiled a wide range of diverse developments in medicine, either indirectly or directly related to pathology, and has woven these into an intelligent, intriguing and educational volume. He has made careful and wise selections. The material is presented in a clear, straightforward, understandable form, showing a personal knowledge and interest in the material by the author. It is an excellent, concise presentation from which students in medicine or those interested in medical development can readily obtain authentic information concerning the mistress of medicine—pathology. The Chronological List of Pathologic Milestones and the Index of Personal Names, with the usual subject index, constitute valuable features and reminders.

Interest is attracted to the volume through its general compilation, size, and printing.

M. PINSON NEAL

The Baby's First Two Years—By Richard M. Smith, M.D. (4th ed.) Boston: Houghton, Mifflin, 1937. 122 pp. Price, \$1.75.

Dr. Smith's book on the care of the baby has been a standard manual for over two decades. This 4th edition has been revised carefully and new material incorporated to bring it up to date. It is written simply, clearly, and to the point. There are no superfluous or ob-

scure statements. The illustrations assembled in the middle of the book are very attractive and helpful. The chapter on "A Typical Day" is practical and should be of great aid to the perplexed mother. The handy guide can be recommended to mothers and prospective mothers without reservation.

RICHARD A. BOLT

Man, Bread and Destiny—By C. Furnas and S. M. Furnas. New York: Reynal & Hitchcock, 1937. 364 pp. Price, \$3.00.

Of the many recent books on nutrition for the general reader, this is one of the best. The authors, one a professor of chemical engineering at Yale, and the other, his wife, a former instructor in nutrition at the University of Minnesota, not only have presented the fascinating story of man's food in a comprehensive and reliable manner, but have produced a most entertaining narrative, sparkling with infectious wit and humor.

Appropriately using "Bread" in their title as synonymous with food generally, the authors begin their story with an interesting, if somewhat conjectural description of the diet of early man, then recount some of the early ramblings in the science of nutrition, and next proceed to a popular account of the physiology of eating and the proper functions in the diet of fats, carbohydrates, proteins, minerals, and vitamins. More is already known about vitaminology than they have told, but this is no disparagement of any modern book on foods, for discoveries in this field seem to come faster than printers can set type.

Other topics treated in this engrossing book include the effects of diet on the teeth, on mentality, and on stamina, and the food fads and follies, aptly characterized as "Gullible's Travels." There is also material on cooking and the psychology of eating, on the economic

aspects of the world's food supply, and on the future of food. An appendix gives data on the best sources of minerals and vitamins for the adequate diet.

That the authors have gone, in general, to the proper sources for their information is shown by a bibliography comprising 24 pages. There is likewise a good index. Anyone interested in the vital subject of food and its effects upon human health, as everyone should be, will find this book very much worth while.

JAMES A. TOBEY

The Measurement of Outcomes of Physical Education for College Women—By *Elizabeth Graybeal*. Minneapolis: University of Minnesota Press, 1937. 80 pp. Price, \$1.00.

This monograph is a report of an experiment carried out at the University of Minnesota in an effort to determine whether the college requirement in physical education for women could be proved justifiable. The subjects for the experiment were freshmen women entering the university in the fall of 1932. After the elimination of those who deviated from the normal to the extent that remedial work was indicated, they were divided at random into an experimental and control group. The experimental group participated in required physical education, while the control group were excluded from participation in required work, and a check was kept on the outside activities of both groups.

Subjects were tested at the beginning of the experiment in 4 objective tests—attitudes, knowledge, motor ability, and posture. They were given the same tests at the end of both 1 and 2 year periods. The attitude test used was developed by John Jacobsen, then on the Committee on Education Research at the university, and consisted of 161 items expressing varying attitudes toward health and physical education

which the students checked if they were in complete agreement with the statement. The knowledge test was constructed by a committee from the staff of the Physical Education Department for Women. It consisted of 355 multiple choice questions on physical education activities and health. The motor ability test was the Graybeal-Minnesota Motor Ability Test Batteries for College Women worked out for the purpose of this study along the line of Cozens' Tests for College Men and made up of strength and coordination tests. Posture was measured by grading photographically: (1) depth of spinal curve, (2) segmental angulation and body tilt, (3) position of head and neck. In addition to the above tests, at the end of the 1 and 2 year periods, part of the Schneider Cardiovascular Tests were given.

Improvement in the functions tested was consistently noted for the experimental group, which was not true for the control group, at the end of both the 1 and 2 year periods. It seems unfortunate from the standpoint of the experiment that some of the colleges at the university do not have the 2nd year requirement in physical education, which meant that the group tested at the end of the 2 year period was comparatively small. The interpretation of those results therefore would seem less reliable. Dr. Graybeal concludes, "that the improvement in the functions tested, while not great in every instance, was demonstrated so consistently by the group who participated in the prescribed course, that the requirement in physical education would seem to be justifiable."

The tests selected by Dr. Graybeal do not measure, of course, all the outcomes of the physical education program, and we might question whether they are the best measure of the functions tested, but there can be no doubt that the experiment was scientifically

carried out, and the book is a well written report of that investigation.

RUBY J. CLINE

Proceedings of the 1936 Annual Conference of the National Society for the Prevention of Blindness. *New York: N.S.P.B.*, 50 West 50th Street, 1937. 134 pp. Price, \$1.00.

This volume of Proceedings contains the papers presented at the Annual Conference dealing with the following subjects: Saving eyesight in industry, eye health in relation to social work, rehabilitation vs. relief, eye health of college students and of school children, the nurses' approach to eye health, and sight saving classes. Data submitted for one state indicate that eye injuries represent 17.1 per cent of all injuries by industry, with machinery manufacture heading the list.

Considering the conservation of eye health, attention is directed to the preliminary examinations, inventories, and case records; periodic eye examinations; correction of defective vision; prompt first aid; sanitary working conditions; proper lighting; and venereal diseases. Tests to determine eye skill are described while the importance of a yearly examination of the eyes of college students as a part of the routine of every health service is stressed. It is made apparent that factors related to sight may have educational, social, and psychological effects upon the development of the child. Impressive financial data are submitted to indicate the value of preventive activities. Health administrators, educators, and social workers will find this volume of practical interest. IRA V. HISCOCK

Child Psychology—By Fowler D. Brooks. *New York: Houghton Mifflin*, 1937. 599 pp. Price, \$3.00.

This new book on child psychology by Professor Brooks deserves more than passing notice. It reveals the

same thorough scholarship and exhaustive research as his companion volume, *Psychology of Adolescence*. He has brought together the results of the leading investigators in his field, and has presented the material in a logical, impartial, clear, and systematic manner. The book covers the psychological development of the child from the prenatal period to adolescence.

Dr. Brooks is not wedded to any particular hypothesis or theory. He does not burden the reader with any special "school of thought." His book is really a compendium of thoroughly sifted scientific data bearing upon the normal growth and development of the child as an integrated individual. It cannot be too highly recommended as a reference volume.

It is completely documented with references to original sources and additional references to the material in each chapter are given at the end. The format of the book is excellent.

RICHARD A. BOLT

First Aid Textbook—American Red Cross (rev. ed.). *Philadelphia: Blakiston*, 1937. 256 pp. Price, \$1.00, cloth, \$.60, paper.

It has been 4 years since the last edition of this book appeared. Many of the same author-physicians participated in this revision. Not content with such formidable authenticity, the manuscript was then submitted to various national organizations and to additional individual specialists on mines, safety, electricity, snakes, fractures, drowning, poisons, rabies, etc. So without stretching the point, we may assume that after this careful preparation and scrutiny, anything which got past these experts and now appears in the text is at least relatively authoritative.

There are 14 chapters: on the need for first aid; anatomy and physiology of the body; dressings and bandages;

wounds; shock; wounds requiring additional consideration; artificial respiration; injuries to bones, joints and muscles; injuries due to heat and cold; poison; unconsciousness; common emergencies; transportation; First Aid kits.

There are 18 drawings and 153 photographs to illustrate the text. The type is sufficiently large throughout to be read even though the reader's hands are shaking. Pages are broken down into numerous paragraphs, numbered or headed with heavy type, as necessary. The authors do not indulge in long dissertations. The reader is never left in doubt. Sentences are often in the form of a command—"Do not rub." "Close the eye."

The preface by Harold F. Enlows, Director, First Aid and Lifesaving Service, American National Red Cross, closes with this statement: "Never has the need for first aid been greater than at present, when accident fatalities of the United States have reached such a proportion that, if those of a year were to happen on a single day, it would plunge the entire nation into mourning as the greatest catastrophe in recorded history."

But that was the preface in the 1933 edition. In the 1937 edition, not a word is said about the incidence of accidents. And for at least one good reason which comes to mind—the accident rate has reached such mighty proportions in this country that Mr. Enlow simply could not find words sufficiently adequate to express the increase over 1933.

To any who think a First Aid Textbook has to be stodgy reading, a glance at the opening sentence of Chapter I: "A heavy truck swings around a blind corner, crashes into an automobile and hurls it over an embankment. A man is pinned under the wreckage." And that is not all. Through "unskilled and ignorant handling, the man's spinal

cord is punctured by a broken bone, so that . . ." But no reviewer gives the plot away. Read it yourself. It is a thrilling book.

In this mad day of commercial lure through offering prizes of every conceivable sort, someone ought to start a movement to give this First Aid Textbook as a prize whatever be the pretext to every person who ventures out of his house. And since the inside of the house is not free from accidents, everybody should have a copy.

W. W. PETER

Handbook of Hygiene—By Joseph W. Bigger, M.D. (5th ed.) Baltimore: Wood, 1937. 405 pp. Price, \$4.00.

Only a few days ago we reviewed a book on hygiene and quoted the author as saying that something of an apology was necessary these days for writing still another book on this subject. The ink was scarcely dry when the present book came to hand. If we had not known something about the author we would have been inclined to pass this by, but reading it has brought its reward.

It is refreshing to find an author who has nerve enough not to follow the usual routine. He begins with a chapter on Vital Statistics, knowledge of which he justly says is commonly lacking among medical men and women. The communicable diseases are dealt with in groups according to their chief methods of spread and not according to the methods of prevention, as in the book mentioned above. The usual subjects treated in a book on hygiene then follow in order. Perhaps of unusual interest is the chapter on Diseases of Uncertain Etiology, in which juvenile rheumatism is divided from adult and senile rheumatism. Juvenile rheumatism, according to the reports, gives an unusual amount of trouble in England, with 1,175 deaths in 1935;

but almost of more importance is the "heart case" or "heart disease" which is left. In the same year, 1935, there were 114,671 deaths from "heart disease," and it is estimated that 40 per cent of these, or approximately 46,000, were the result of juvenile rheumatism. The author recommends 3 months' complete rest in bed for every frank case, followed by 6 months of supervision, a treatment which he feels sure would result in great diminution of after effects.

The author calls special attention to the chapter on Poisonous Gases, which he says may become a matter of immediate concern to doctors as well as the general public. In this he reflects the attitude of European countries and especially, it seems, of England, which is manufacturing gas masks on a stupendous scale, distributing them to the public in enormous numbers, and teaching all, even children, their use.

The book is designed to supply practical information to doctors in practice and to medical students, not for post-graduate students or those working for a Diploma in Public Health. Much as we like the book, we believe it is not one to recommend to medical students, except possibly during their first year. There is a lack of history and the reviewer has long been an advocate of the historical method of teaching. The outstanding feature of the book is its common sense and, what amounts to much the same thing, practical usefulness. Immediately under the name of each disease the causative organism and the period of incubation are given.

The book is written in easy and readable style, very free from errors, and can be commended.

MAZÏCK P. RAVENEL

Take Care of Yourself: A Practical Guide to Health and Beauty—Stressing the Proper Way to Use

and the Prudent Way to Buy Home Remedies and Cosmetics—By Jerome W. Ephraim. New York: Simon and Schuster, 1937. 287 pp. Price, \$2.00.

Certain important aspects of personal health are competently set forth in this book by a layman who is stated by Dr. Logan Clendening in a felicitous foreword to be an "Honest" manufacturer of drugs, cosmetics, and toilet articles. Unlike many of the sensational books that have emanated recently from officials of self-appointed consumers organizations, it is not malicious, misinformed, and meretricious, but is, in general, medically sound and well balanced. Mr. Ephraim writes intelligently and informatively of the care of the teeth, hair, skin, and feet; he also discusses common colds, digestive disturbances, constipation, reducing, vitamins, pain killers, sleep, and antiseptics. Perhaps his best chapter is, seriously, one entitled, "Your Hangover and How Not to Have One." The innumerable purchasers of cosmetics and home remedies will find much of practical value in this interesting book.

JAMES A. TOBEY

Socialized Medicine in the Soviet Union—By Prof. Henry E. Sigerist, M.D. New York: Norton, 1937. 378 pp. Price, \$3.50.

Written frankly from the Marxian viewpoint, Sigerist has given us a book which no one interested in public health can afford to miss. It is not a report but a sociological study: yet it is packed full of facts showing the tremendous progress which has been made in Soviet medicine during the past 20 years. When, following the Great War, the revolution, foreign intervention, drought and famine, the Soviet Union reorganized its medical service, it started from the scratch. During the 20 years from 1913 to 1933 Sigerist tells us that the number of

physicians increased 4 times—from 19,785 to 80,423. In 1936 there were approximately 90,000 physicians and the 1937 health plan called for 107,000. Although this is tremendous, it is insufficient, says Dr. Sigerist. The plan toward which they are working in the Soviet Union calls for 1 doctor per 1,000 of population, which indicates that they are still short 70,000 doctors and 3,000 additional physicians will be needed each year to keep up with the increase in population. The medical schools are rapidly catching up, and although the quality often leaves much to be desired, it too is improving with amazing rapidity.

The author asserts that the Soviet Union was

... the first country that has ever attempted to socialize medicine, the first that ever considered the protection of all the people's health a public function of the State. Much remains to be accomplished in the public health field and no one knows it better than the men who were responsible for the work. I, too, am well aware of present deficiencies in Soviet medicine. . . . There are poor institutions poorly equipped and managed. In Russia as elsewhere, you find bureaucrats and fools and people who like to take the way of least resistance but these shortcomings are seen and admitted freely. They are discussed openly and means and ways are sought to overcome them—not at some uncertain time in the future, but at a definite date according to plan.

Sigerist frankly acknowledges that he has not stressed inadequacies and inefficiencies in his book nor has he wasted time in describing poor institutions.

I have been primarily interested in the principles of Soviet medicine and those positive achievements which represent a permanent gain. . . . My method in this book was like that in the one on American Medicine. There also, I could have written many pages on poor institutions, on the practice of fee-splitting and other dark aspects of American medicine. I omitted them for the same reason because I was convinced that only the positive achievements of

American medicine would in any way enrich the world.

Not only public health officials and medical men but all who are interested in social phenomenon and social experiments will be interested in this book. Every educator in the land, every college professor and college president, and every social worker as well as every health officer, should read this valuable volume. JOHN A. KINGSBURY

Federal and State Control of Milk Prices—By James A. Tobey, Dr.P.H. Chicago, Ill.: International Association of Milk Dealers, 1937. 42 pp. Price, \$2.00.

This concise volume supplements effectively *The Legal Aspects of Milk Control* by the same author. Members of the dairy industry as well as milk control officers will find useful this discussion of government regulation of milk prices and the production and distribution of milk. The volume reviews the Constitutional status of laws fixing prices and regulating the production and distribution of milk as shown by court decisions. IRA V. HISCOCK

The Pneumonokonioses (Silicosis). Literature and Laws—Book III—By G. G. Davis, E. M. Salmonsen, and J. L. Earlywine. Chicago: Chicago Medical Press, 1937. 1033 pp. Price, \$8.50.

The third book in the series on the pneumonokonioses covers the period 1915–1936. The two previous books contained references dated from 1556 to 1934 inclusive. The present volume is made up on the same plan as Book I and Book II: a brief abstract of each article issued during the year is given. These abstracts are usually well done and in sufficient detail to indicate the value of the article to the reader. The book is in two parts, with an author and subject index between Part I (Abstracts) and Part II (Laws). The

reviewer again wishes to commend the authors for their work which is so useful to those interested in the subject.

R. R. SAYERS

School Nursing: A Contribution to Health Education—By *Mary Ella Chayer, R.N.* (2nd ed.) New York: Putnam, 1937. 329 pp. Price, \$3.00.

In this second edition, revised and enlarged, Miss Chayer has retained all that was fundamental and helpful in the edition of 1931 and has added much of value accumulated in the intervening years. A new chapter on Rural School Nursing has been added. The author has recognized that the public health nurse should be a health educator and that with special training

in the principles of education she may become a valuable asset in the secondary as well as the elementary schools. The chapter on the preparation of the nurse for school health work indicates the modern trend in nursing education. From a practical standpoint the chapter on the administrative relationships of the nurse with the school should be of considerable help to nurses trying to find themselves, in a complicated situation. The volume is practical in its every chapter. It could be consulted with profit by school executives and public health officials as well as by nurses seeking light on school nursing. The book is supplied with a good working bibliography.

RICHARD A. BOLT

BOOKS RECEIVED

LET'S HELP THE DOCTOR. By M. O'Donovan-Rossa. New York: Devan-Adair Co., 1937. 141 pp. Price, \$1.50.

ATLAS OF SKELETAL MATURATION. By T. Wingate Todd. St. Louis: Mosby, 1937. 202 pp. Price, \$7.50.

APPROVED LABORATORY TECHNIC. By John A. Kolmer and Fred Boener. 2nd ed. New York: Appleton-Century, 1938. 893 pp. Price, \$8.00.

TOXICOLOGY. By William D. McNally. Chicago: Industrial Medicine, 1937. 1022 pp. Price, \$10.00.

THE COLLAPSE THERAPY OF PULMONARY TUBERCULOSIS. By John Alexander. Springfield, Ill.: Thomas, 1937. 705 pp. Price, \$15.00.

NURSES HANDBOOK OF OBSTETRICS. By

Louise Zabriskie. 5th ed. Philadelphia: Lippincott, 1937. 724 pp. Price, \$3.00.

HEALTH. By C. E. Turner and Georgie B. Collins. 3rd ed. New York: Heath, 1937. 231 pp. Price, \$.72.

CLEANLINESS AND HEALTH. By C. E. Turner and Georgie B. Collins. 3rd ed. New York: Heath, 1937. 236 pp. Price, \$.80.

MILK CONTROL. Governmental Control of the Dairy Industry in the United States. Prepared by the American Municipal Association, Chicago: American Municipal Association, 1937. 49 pp. Price, \$.75.

ALCOHOL: ONE MAN'S MEAT. By Edward A. Strecker and Francis T. Chambers. New York: Macmillan, 1938. 230 pp. Price, \$2.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Less Canadian Syphilis? — In Toronto 6,188 persons were reported as under treatment for venereal diseases in May, 1937, a rate of 9.6 per 1,000. Although there was an increase in late cases of syphilis as compared to a similar survey in 1929, there was a 50 per cent decrease in new cases.

BATES, G. A Survey of the Incidence of Venereal Diseases in Toronto in 1937. *Canad. Pub. Health J.* 28, 12:575 (Dec.), 1937.

Wholesale Sewage Disposal—Describing the new New York sewage treatment plant about which every statistician runs into the multiple millions, whether it is dollars of costs, gallons of sewage, or customers served. One gathers that it is an outstanding job excellently done.

BINGER, W. D., and GOULD, R. H. The Wards Island Sewage Plant. *Munic. San.* 8, 12:627 (Dec.), 1937.

Report on Public Relations—At the tenth Annual Conference of the (British) Central Council for Health Education, at which there were over 400 representatives of official and voluntary agencies, the discussion was chiefly concerned with the current national health promotion program, and the possibilities in it for health education to secure better use of existing public health machinery.

CHRYSTAL, G. Public Relations of the Public Health Services. *Pub. Health.* 51, 3 (Supplement) (Dec.), 1937.

About Gonorrhea—In this British experience covering 250 cases, sulfanilamide was found to cure gonorrhea in

most patients with both acute and chronic infections, within a week. The necessary precautionary measures are covered. If cases are rendered non-infectious as promptly, the use of the new drug is a valued addition to the prevention as well as the cure of gonorrhea.

COKKINIS, A. J. Treatment of Gonorrhea with Oral Sulfanilamide. *Brit. M. J.* Nov., 1937, p. 905.

Toward Three Score and Ten—In 1930 the expectation of life at birth for white males was 50 and for females 63 years. The decline in mortality has been most rapid in childhood; above 50 the rates remain unchanged. The current remarkable increase in life expectancy cannot continue in the next generation unless methods are developed for controlling diseases of middle life. The ultimate longevity attainable under present conditions is 70 years. This paper should be studied by every health worker: "must" reading for everyone.

DORN, H. F. The Increase in Average Length of Life. *Pub. Health Rep.* 52, 49: 1753 (Dec. 3), 1937.

Diagnosing Undulant Fever—Discussing the meanings of the skin test, the opsonic and rapid agglutination tests, and cultural methods for brucella infection. The first is the most sensitive. If it is positive, then the second should be performed.

GOULD, S. E., and HUDDLESON, I. F. Diagnostic Methods in Undulant Fever (Brucellosis). *J.A.M.A.* 109, 24:1071 (Dec. 11), 1937.

About Syphilis — Having been brought up on the belief that a repeated positive Wassermann meant syphilis (with easily determined exceptions) and that all syphilis should be treated, this paper raising some question of the value of treatment in the presence of positive Wassermans without other signs of syphilis comes as a great shock. Despite the article, here is one who still believes that syphilis should be treated as long as it exists, providing there are no contraindications.

HINTON, W. A. The Significance of a Positive Blood Test in Syphilis. *New Eng. J. Med.* 217, 25:978 (Dec. 16), 1937.

Allaying Fears of the Asylum—How a state mental hospital assists the surrounding rural communities with ever-present mental hygiene problems is told. Thanks to a continuing educational program and clinic services, 142 of the 776 admissions in 1936 were voluntary, whereas before the program, one or two a month was the rule.

JACKSON, J. A. An Approach to a Rural Mental Health Problem. *Pub. Health Rep.* 52, 49:1777 (Dec. 3), 1937.

Population Problems—This British author observes that the cocksureness with which the contention is made that the poor have more children than the well-to-do, that the agricultural population is more fertile than the industrial, would incline one to assume that statistics prove the assumptions or that they are so obvious that statistics are unneeded. Neither assumption is correct, he says, and tells why. We really ought to have accurate data before we attempt to discuss population trends and the possibility of influencing them.

KUCZYNSKI, R. R. The Future of Our Population. *J. Roy. San. Inst.* 58, 6:356 (Dec.), 1937.

Eugenists Will Be Pleased—Reporting that, in Alberta (Canada),

the work of sterilizing the insane and mentally deficient has gone on quietly, efficiently, and preëminently satisfactorily.

MACLEAN, R. R., and KIBBLEWHITE, M. A. Sexual Sterilization in Alberta. *Canad. Pub. Health J.* 28, 12:587 (Dec.), 1937.

Last Word on Pneumonia—What every health worker should know about the diagnosis and serum treatment of pneumonia. Required reading.

MCCANN, W. S., *et al.* Postgraduate Institute on Pneumonia. *J.A.M.A.* 109, 25:2056 (Dec. 18), 1937.

Despite Inadequate Public Health Measures—Measles death rates have declined, presumably because mothers have been taught to regard the disease seriously and to prevent needless exposure of very young children, and through general improvement in infant nutrition. The author suggests that if immune serum is given, it should be delayed from 5 to 9 days after exposure to modify rather than prevent the attack.

MCKHANN, C. F. The Prevention and Modification of Measles. *J.A.M.A.* 109, 25:2034 (Dec. 18), 1937.

When We Were Young—Public health conditions in England a half century ago. These reminiscences by a British M.O.H. are amusing and revealing, and lead to much soul-searching.

ROBINSON, E. S. Forty-four Years of Public Health Work. *Pub. Health.* 51, 3:67 (Dec.), 1937.

Wholesale Health Protection—An absorbing story of the planning, implementing, and organization of the medical and health services for the recent Boy Scout encampment at Washington. Commenting on the whole affair, the author mentions the unusual experience of having 27,000 visitors for 10 days without a single fight, a single

drunk, or case of venereal disease, or a single day spent by a visitor in jail!

SMITH, W. L. Medical Activities at the Boy Scout Jamboree Held in Washington, D. C., June 30-July 9, 1937. *Pub. Health Rep.* 52, 51:1854 (Dec. 17), 1937.

Doubts About Polio Prophylaxis

—In the face of a Toronto epidemic, about 4,500 children received 2 zinc sulphate nasal sprays to protect them against poliomyelitis. Eleven cases occurred while in a control group of 6,300 children 19 cases were reported. The spraying caused no serious complications. The study furnishes no evidence, the authors conclude, that nasal spraying as practised has any protective value against poliomyelitis, and as the

treatment requires the services of otolaryngologists, and cannot be done sufficiently quickly to meet an emergency, it cannot be considered a practical public health procedure. These are disheartening conclusions.

TISDALL, F. F., *et al.* Zinc-Sulphate Nasal Spray in the Prophylaxis of Poliomyelitis. *Canad. Pub. Health J.* 28, 11:523 (Nov.), 1937.

More About Another Tuberculin Test—Tuberculin ointment applied to the skin in a patch test is suggested as a superior substitute for the von Pirquet or Mantoux test.

WOLFF, E., and HURWITZ, S. Further Studies with the Tuberculin Ointment Patch Test. *J.A.M.A.* 109, 25:2042 (Dec. 18), 1937.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

George M. Anderson, M.D., Morgan, Ga.,
Director, Calhoun County Health Dept.
Vernon M. Boothby, Chestnut Hill P.O., Lebanon, Conn., Health Officer
A. Edward Bostrom, M.D., 1512 S.E. 16 Ave., Portland, Ore., Assistant State Health Officer
Frank A. Calderone, M.D., C.P.H., Jericho Tpke., Westbury, N. Y., Epidemiologist, New York State Dept. of Health
George R. Carpenter, M.D., Health Dept., Bristol, Va., Health Officer, Bristol-Washington County Health District
Hilary J. Connor, M.D., Wallum Lake Sanatorium, Wallum Lake, R. I., Superintendent
George M. Decherd, M.D., Breckenridge Hospital, Austin, Tex., Assistant City Health Officer
Reginald G. M. Ehlers, M.D., Court House, Helena, Mont., City-County Health Commissioner
Richard H. Fletcher, M.D., 1412 Smith Tower, Seattle, Wash., Assistant State Director of Health
Thomas E. Gibson, M.D., Eaton County Health Dept., Charlotte, Mich., Director
John B. Hall, Jr., M.D., 364 E. 48th, Chicago, Ill., Medical Officer, State Dept. of Public Health
Donald M. Harris, M.D., Box 443, North Platte, Nebr., Medical Director of District Health Unit 3
Coit I. Hughes, M.D., State Board of Health, Phoenix, Ariz., Superintendent
Robert H. Onstott, M.D., Holmes County Health Dept., Lexington, Miss., Director
Owen W. Parker, M.D., Shipman Hospital, Ely, Minn., City Health Officer
Arthur L. Ringle, M.D., C.P.H., Grandview Apts., Kelso, Wash., Cowlitz-Wabkiakum County Health Commissioner
Michael T. Russell, 23 Moreland St., Brookton, Mass., Executive Officer, Board of Health
Erwin C. Sage, M.D., C.P.H., City Hall,

Burlington, Ia., Director, Des Moines County Health Unit
William R. Willard, M.D., Dr.P.H., Pocomoke City, Md., Deputy State Health Officer

Laboratory Section

Edward B. Anderson, United Dairies, Ltd., Wood Lane, London, W12, England, Chief Chemist
Gilbert B. Ayres, Ph.D., American Cyanamid Co., Stamford, Conn., Research Bacteriologist
John H. Beltz, 3340 N. Broad St., Philadelphia, Pa., Chemist and Bacteriologist, Bell and Beltz Laboratories
Elizabeth C. Brown, 5700 Clemens Ave., St. Louis, Mo., Bacteriologist, Dept. of Health
Ida L. Brown, 801 E. 13th St., Oklahoma City, Okla., Instructor in Bacteriology and Public Health, University of Oklahoma, School of Medicine
Irma L. Comstock, State Board of Health Laboratory, Jefferson City, Mo., Laboratory Technician
Edward G. Curtiss, 143 Court St., Elyria, O., City Chemist
R. Eugene Dyer, M.D., National Institute of Health, Washington, D. C., Chief, Division of Infectious Diseases
Lan L. Hewlett, 710 W. 19th, Austin, Tex., Bacteriological Technician, State Health Laboratory
Donlin M. Long, 714 Adams St., Jefferson City, Mo., Assistant Chemist, State Board of Health Laboratories
Alice G. Mann, 323 E. 17 St., New York, N. Y., Laboratory Assistant, Dept. of Health Laboratories
Alton M. McKissiek, 309 Market St., Knoxville, Tenn., Director, Knoxville Branch Laboratory
Lucy Mishulow, 323 E. 17 St., New York, N. Y., Bacteriologist, Dept. of Health
Agustin M. Montero, M.D., J. A. Saco alta

31-A, Santiago, Cuba, Director of Oriente Division of National Health Laboratory
Nathan Nagle, 33 Municipal Courts Bldg., St. Louis, Mo., Supervisor of Bacteriology, City Health Division Laboratory

Leonard J. Piccoli, Ph.D., Fordham University, Bronx, N. Y., Professor and Head, Dept. of Physiology and Hygiene

Charles S. Puntney, 426½ W. Capitol Ave., Springfield, Ill., Bacteriologist, State Dept. of Public Health

Clare Wilcox, 225 E. 79 St., New York, N. Y., Bacteriologist, New York University

Vital Statistics Section

Alfred H. Sellers, M.D., D.P.H., Ontario Dept. of Health, East Block, Toronto, Ont., Canada, Medical Statistician

Public Health Engineering Section

Robert L. Davison, 40 W. 40 St., New York, N. Y., Director of Housing Research, John B. Pierce Foundation

Harold B. Gotaas, 2 Westwood, Chapel Hill, N. C., Assistant Professor of Sanitary Science

Jack C. Rogers, 130 S. Elm St., Centralia, Ill., Sanitary Engineer and Milk Inspector, St. Louis Dept. of Public Welfare

John E. Vogt, 317 N. Franklin St., Mt. Pleasant, Mich., Sanitary Engineer, Isabella County Health Dept.

Frederick D. Zollner, 310 Riverside Ave., Scotia, N. Y., Assistant Sanitary Engineer, New York State Dept. of Health

Industrial Hygiene Section

Louis Press, 15 Hollingsworth St., Lynn, Mass., Assistant Industrial Hygienist, State Bureau of Occupational Diseases

Robert T. Pring, Utah Copper Co., Garfield, Utah, Industrial Hygienist

Food and Nutrition Section

Anna E. Boller, 66 Woodside Rd., Riverside, Ill., Dietitian, Central Free Dispensary, Rush Medical College

Harlow H. Hall, U. S. Dept. of Agr., Bur. of Chemistry and Soils, Washington, D. C., Associate Bacteriologist, Food Research Division

Pauline Murrah, 125 Worth St., New York, N. Y., Nutrition Instructor, Dept. of Health

Child Hygiene Section

David Kliger, M.D., 11814 Dexter, Detroit, Mich., Medical Coördinator of Wayne County for Crippled and Afflicted Children's Acts

Arthur W. Thomas, M.D., State Dept. of Health, Columbus, O., Chief, Bureau of Child Hygiene

Public Health Education Section

John E. Codwell, 1114 Robin St., Houston, Tex., Director of Physical and Health Education, Wheatley High School

Ruth Connely, 545 Canyon Rd., Santa Fe, N. M., Executive Secretary, New Mexico Tuberculosis Assn.

Emily A. Spraker, 17 Ford Ave., Oneonta, N. Y., Executive Secretary, Otsego County Tuberculosis and Public Health Assn.

Jesse R. Thompson, D.D.S., 1110 State Capitol Bldg., Lincoln, Nebr., Director of Dental Hygiene, Division of Maternal and Child Health, State Dept. of Health

Myron T. Townsend, Ph.D., Illinois Wesleyan University, Bloomington, Ill., Head of Dept. of Biology

Ruth H. Weaver, M.D., 1433 Spruce St., Philadelphia, Pa., Epidemiologist, Dept. of Public Health

Public Health Nursing Section

Jane S. Dayton, R.N., 107 W. Madison Ave., Johnstown, N. Y., District State Supervising Nurse

Pearl Shalit, R.N., 1116 Ashland Ave., St. Paul, Minn., Educational Director, St. Paul Family Nursing Service

Margaret A. Stockton, R.N., 10 Mountain Rd., Ravena, N. Y., Rural Public Health Nurse, New York State Dept. of Health

Emily P. H. Talbot, Babies Hospital, Philadelphia, Pa., Superintendent and Director of Nursing Service

Julia W. Wheeler, St. Lawrence Inn, Gouverneur, N. Y., Assistant Supervising Nurse, State Dept. of Health

Odessa M. Winters, 319 E. 15 St., Tulsa, Okla., Acting Director of Nursing, State Dept. of Public Health

Epidemiology Section

Fred W. Caudill, M.D., C.P.H., State Dept. of Health, Louisville, Ky., Director, Division of Communicable Diseases

Gustav A. I. Hallden, M.D., Kungsgaten 1 a, Vanersborg, Sweden, Medical Officer of Health

Alexander D. Langmuir, M.D., State Office Bldg., Albany, N. Y., Medical Consultant, Bureau of Pneumonia Control, State Dept. of Health

Abel Mejia, Conde a Carmelitas 6, Caracas, Venezuela, S. A.

Unaffiliated

William Boaz, Pan American Sanitary Bureau, Washington, D. C., Chief Sanitary Engineer

R. C. Dalglish, D.D.S., 124 Capitol Bldg., Salt Lake City, Utah, Director, Division of Dental Health, State Board of Health
Mildred R. de Long, Durfee Intermediate School, 2470 Collingwood, Detroit, Mich., Student

Ralph H. Fash, 828½ Monroe St., Fort Worth, Tex., Consulting Chemist

Maurice B. Folb, Sr., P. O. Box 186, Chapel Hill, N. C., Student Sanitarian

Waldo R. Hainsworth, 621 Pennsylvania Ave., Norfolk, Va., Sanitarian, City Health Dept.

A. E. Hollenbeck, 618 Packard, Ann Arbor, Mich., Trainee

Marie E. Kopp, Ph.D., 67 Echo Lane, Larchmont, N. Y., Research Worker in Maternal Health and Eugenics

Francis C. Lawler, Sc.D., Univ. of Okla.,

School of Medicine, Oklahoma City, Okla., Assistant Professor of Bacteriology

Flora M. Lewy, Ph.D., 39th & Chestnut St., Philadelphia, Pa., Study group on public health, League of Women Voters

Sarah I. Morris, M.D., Henry Ave., & Abbot'sford Rd., Philadelphia, Pa., Professor of Preventive Medicine, Woman's Medical College of Penna.

C. J. A. Paule, M.D., 322 N. State St., Ann Arbor, Mich., Trainee, Social Security

Dr. Thomas G. Perrin, 4a Calle de las Artes 71, Mexico, D. F., Mex., Laboratorios de Biología Medica

William M. Smith, M.D., 615 N. Wolfe St., Baltimore, Md., Physician in training, New York State Dept. of Health

John D. Spiggle, c/o Mullett, New Martinsville, W. Va., State Sanitarian

K. S. Viswanathan, M.B., Harvard School of Public Health, Boston, Mass., Student on leave (Assistant Professor of Hygiene, Medical College, Madras, India)

ROYAL SANITARY INSTITUTE

THE Royal Sanitary Institute will meet in Portsmouth, England, July 11-16.

The Executive Secretary of the A.P.H.A. desires to know of any Fellows of the Association who plan to be in England during this period.

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50th Street, New York, N. Y.

POSITIONS AVAILABLE

The Department of Civil Service, State of New York, Albany, announces State un-written examinations for which applications should be filed by February 25 as follows:

No. 28. Assistant Director for Oral Hygiene, Division of Maternity, Infancy and Child Hygiene, Department of Health. Appointment expected at \$4,000. Responsibility, to develop a state-wide oral hygiene program. Must be graduates in dentistry and licensed to practise in New York State, with at least

5 years of satisfactory experience and post-graduate study.

No. 29. Chief of Health Education (Health Service), Division of Health and Physical Education, Department of Education. One appointment expected at \$5,000. Duties: To organize and supervise the health service program, conducted by the State in the public schools and teaching institutions. M.D. degree required, with license to practise in New York State.

EMPLOYMENT SERVICE (Cont.)

POSITIONS WANTED

HEALTH OFFICERS

Physician, M.D., Johns Hopkins; public health course at Michigan; experienced in school and city health work, will consider an administrative post in eastern United States. A354

Experienced physician, administrator, epidemiologist, and teacher, now employed, with C.P.H. from Johns Hopkins and 14 years public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, M.D., University of Maryland; C.P.H., Johns Hopkins; broad experience in county public health administration, will consider opening of better class. A346

Physician, M.D., Yale, completing M.S.P.H. at Columbia; good clinical background; will consider appointment in child health, epidemiology, or public health administration. A350

Physician, M.D., Western Reserve; short course for health officers, Johns Hopkins; with county and state experience, wishes administrative or epidemiological position; North or West preferred. A349

Physician, M.D., Northwestern University; Dr.P.H., Yale; will consider appointment in general administration, infant welfare, or epidemiology. A300

CHILD HYGIENE

Women physician, M.D., Creighton Medical School, with extensive experience in maternal, infant and child hygiene, and special interest in crippled children's service, desires position in field work. C301

Woman physician, M.D., Yale, Dr.P.H., Yale; experienced in pediatrics and administration of state bureau, will consider attractive opening. C348

SANITARY ENGINEERING

Graduate Sanitary Engineer with service under U. S. Public Health Service and State Departments of Health, especially interested

in filtration plant design and operation and shellfish sanitation, seeks employment. E356

Sanitary Engineer, courses at Rutgers University, with 17 years' experience in design, research, and construction of water and sewage plants, as well as aerial pollution surveys, desires position, preferably research. E321

STATISTICIAN

Young man with 8 years' experience in public health statistics in well known national organization, and degree in Business Administration, now employed, will consider statistical position or combination with office administration. A310

MISCELLANEOUS

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. M352

Young woman, M.S., University of Minnesota, wishes position as health education director. An excellent background of experience covers directorship of a state laboratory of hygiene, health education director of a state tuberculosis association, instructor in bacteriology and health education, and executive secretary of a dairy council. M326

Woman with excellent preparation and wide experience in health education field; organization, administration, supervision, and program-making in city, rural and state work. Now employed but would consider good opportunity. \$3,500 minimum. M316

Experienced teacher, B.S., Massachusetts Institute of Technology; graduate courses Harvard School of Public Health, wishes teaching position or will consider statistical or health education opportunity. M353

Young man, at present college teacher of hygiene and physical education and experienced in university medical service, desires position as executive in public or private health organization. M357

NEWS FROM THE FIELD

BETTER CARE FOR MOTHERS AND BABIES

UNDER the auspices of the Children's Bureau of the U. S. Department of Labor, a conference on Better Care for Mothers and Babies was held January 17 and 18 in Washington. More than 400 persons were in attendance from 47 states and the Territories of Hawaii and Alaska, and there were included representatives of 86 coöperating agencies. The American Public Health Association was represented by the President, Dr. A. T. McCormack; Dr. John L. Rice of New York City, and the Executive Secretary.

The conference was addressed by Frances Perkins, Secretary of Labor; Katharine F. Lenroot, Chief of the Children's Bureau; Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service; Josephine Roche, former Assistant Secretary of the Treasury; Dr. Fred L. Adair of Chicago; Dr. Robert L. DeNormandie of Boston; Dr. Martha Eliot of the Children's Bureau; James Roosevelt, Secretary to the President; and other leaders.

That there has been an unnecessary loss of maternal and infant life was made clear by the facts presented, indicating that more than 14,000 women in the United States die from causes connected with childbirth each year, leaving at least 35,000 children motherless. In addition, more than 75,000 infants are stillborn and more than 69,000 infants die during the first month of life. The Findings Committee pointed out that there has been little reduction in the maternal mortality rate during the 22 years for which records are available. It was agreed from the

testimony of several committees of physicians in various parts of the country, after careful evaluation of the causes of death of individual mothers, that from one-half to two-thirds of maternal deaths are preventable. Although the death rate for infants in the first year of life has steadily declined during the last 22 years, there has been little decline in the death rate for the first month of life which accounts for nearly half the total loss of life in the first year.

That there are very important economic aspects of this problem was made evident by the fact that approximately 840,000, or more than one-third of the total births each year, occur in families which are on relief or which have total incomes including home produce of less than \$750 a year. In 1935, 14 per cent of all live births in the United States occurred in the 6 most prosperous states which received 27 per cent of the total income. Fourteen per cent of all live births occurred in the 6 poorest states which received only 5 per cent of the total income.

The conference concluded that, while certain communities through public and private effort have provided a physician's care and hospital care for mother and child at birth when such care cannot be paid for by the family, there has nevertheless been no widespread effort on a national scale to make medical and nursing care at the time of delivery generally available either in the home or in the hospital for mothers in families which cannot obtain such care unaided. A quarter of a million women were delivered in

1936 without the advantage of a physician's care and more than 15,000 had no care except that of the family or neighbors.

The conference concluded that preserving the lives and health of mothers and babies is of such paramount importance to all the people that it fully warrants immediate and concerted national consideration and national action. Urging that better facilities should be provided in medical schools, both for undergraduate and graduate instruction, to medical students, physicians, and nurses, the conference went on to the conclusion that the American standard would demand the supervision of each mother throughout her pregnancy by a qualified local physician aided by a public health nurse, together with care at delivery by the same qualified local physician and a nurse trained and experienced in delivery nursing care. Postpartum and postnatal medical and nursing supervision were regarded as most important, and the provision of facilities for consultation service by obstetricians and pediatricians to aid general practitioners in their care of mothers and babies was concluded to be essential.

With special reference to the public health aspects of this problem it was recommended that public health services both in cities and rural areas be further developed for the conduct of complete service in maternity and for the new-born infant through utilizing available competent service under both public and private auspices, extending and approving the public services when they are not adequate to meet the need. The local community must provide maternal and infant care as needed as a part of its public health responsibility, the state giving leadership, financial assistance, specialized service, and supervision in the development of local services as required, and the federal government to assist the

states through financial support, research, and consultant service.

Specifically it was recommended that Title V, Section 502, of the Social Security Act be amended to authorize a larger sum to be appropriated annually to the states for maternal and child health services with provision that the increased payments to the states should be used for the improvement of maternal care and the care of new-born infants.

The conference concluded that the extent to which this plan can be made a reality will depend upon the desire of the public to be served adequately, upon the leadership of the professional groups in the provision of service of high quality, and upon the development by public agencies in coöperation with private agencies and individuals of a program of education and of medical and nursing care adequate to meet the needs of the various groups in the population.

INDUSTRIAL HYGIENE AND TOXICOLOGY COURSE

THE Department of Chemistry of the University of Pittsburgh, Pittsburgh, Pa., will give a new course on "Industrial Hygiene and Phases of Toxicology," beginning February 9 and consisting of a series of 16 lectures by Emerson Venable,* of the Westinghouse Research Laboratory, Pittsburgh, formerly for several years with the Mine Safety Appliances Company studying protective methods and devices.

This is said to be the first course of its kind to be offered primarily to students of science not directly connected with medicine or public health. It is designed to promote knowledge of the medical and pharmacological significance of the materials handled by the average graduate in chemistry.

* Fellow A.P.H.A.

† Member A.P.H.A.

COURSES IN SYPHILIS

A PROGRAM of postgraduate study in syphilis has been arranged at New York University College of Medicine to extend from February 15 to June 15, 1938. The course is made possible by a grant from the U. S. Public Health Service through the New York State Department of Health.

The training is intended primarily for physicians already working in state and local departments of health, but other physicians may be accepted. The work will be done in the New York University College of Medicine, in the syphilis clinics and wards of Bellevue Hospital, and in the various laboratories and bureaus of the New York City Department of Health devoted to venereal disease study.

Physicians at present engaged in health department work may apply either directly to the office of the dean at the College of Medicine, 477 First Avenue, or through their state health departments. Others should apply directly to the college.

The Health Officer, published by the U. S. Public Health Service, for October 1937, lists similar courses in Massachusetts at Harvard University, in Tennessee at Vanderbilt, in Ohio at Western Reserve, and in California at a university to be selected. A course is under way at Howard University Medical School for Negroes in Washington, D. C., and at the Johns Hopkins School of Hygiene and Public Health, Baltimore. It is stated also that arrangements have been made by the Pennsylvania State Department of Health to offer such a course with the University of Pennsylvania at Philadelphia.

\$61,000,000 FOR HUMAN NEEDS

A \$61,000,000 gift to charity, to be used during 1938 to aid people of 311 cities, was reported to Charles P. Taft, Chairman of the Community

Mobilization for Human Needs, by community chests throughout the United States and Canada.

Coöperative campaigns sponsored by the Mobilization during the last 3 months of 1937 for social and health agencies have been successful in raising 3 per cent more than they did in 1936, according to records of its administrative agency, Community Chests & Councils, Inc. Mr. Taft said:

An increase of 3 per cent in charitable gifts, made in the face of a falling market and disturbed labor conditions, is a triumph of community spirit. . . .

With the results expected from 155 additional chest campaigns—including those still to be held by Boston, Philadelphia, Rochester, and Cincinnati—a total of more than \$83,000,000 is anticipated for the support of community philanthropies in 1938.

This sum will be appropriated during 1938 to about 8,500 local agencies providing such varied services as aid to dependent children and to families in distress, hospitals and home nursing care for the sick, settlements and day nurseries, guidance and character building of youth through clubs and camps.

Fully 9,000,000 contributors, it is estimated, will have added their gifts, large and small, to reach the total.

NEW DIRECTOR OF PUBLIC HEALTH
IN MEXICO

NEWS dispatches under the date of January 4 from Mexico City indicate that Dr. Leonidas Almazan, former Minister from Mexico to Germany, was named Director of Public Health succeeding General Dr. Jose Siurob who has been transferred to the Directorship of the Federal District including Mexico City. The dispatches indicate that Dr. Enrique Hernandez Alvarez has been appointed Secretary of Public Welfare in a post which now has important relationships to the Department of Public Health.

NATIONAL ASSOCIATION OF SANITARIANS

THE National Association of Sanitarians held its annual convention on December 11, 1937, in San Luis Obispo, Calif.

Sanitarians present represented 20 full-time health departments and 16 trainees were present from the Western School of Public Health in session at the University of California. Berkeley; 103 delegates attended the banquet.

Officers elected for 1938 include:

President—Jack C. Baker,† San Diego County Health Department, San Diego, Calif.

First Vice-President—L. D. Spence, San Bernardino County Health Department, San Bernardino, Calif.

Second Vice-President—William V. Butler, Oakland City Health Department, Oakland, Calif.

Treasurer—Charles G. Kahlert, Los Angeles County Health Department, Los Angeles, Calif., and a board of 9 directors, from Arizona, California, Utah, and Washington, was elected.

A resolution was passed authorizing the Board of Directors to publish an official magazine to be known as "The Sanitarian."

CHILI HONORS DR. GEIGER

THE Government of Chili has granted to J. C. Geiger, M.D.,* the decoration "Cruz de Caballero de la Orden del Merito," for good friendship and assistance to Chili and for his excellent work in and outstanding contributions to public health.

DYE PREPARATIONS

DR. George C. Ruhland, Health Officer of the District of Columbia, has announced that "Lash Lure" and similar dye preparations are prohibited from sale, distribution and use in the District of Columbia. Similar prohibitions are in force for New York City and Chicago. The Health Department chemical laboratory reported that an analysis of the sample of

"Lash Lure" shows it to consist of para-phenylene diamine or a closely related compound, and a small amount of magnesium carbonate.

CONNECTICUT CRIPPLED CHILDREN PROGRAM

UNDER the Social Security Act, Connecticut will receive \$60,000 from the federal government to be added to a similar amount appropriated by the last session of the general assembly for the state's crippled children program, it is reported.

The program will include the establishment of 5 permanent diagnostic clinics throughout the state.

SOCIAL HYGIENE MEETING

THE American Social Hygiene Association will hold its Annual Meeting this year in New York City, as a part of the New York Regional Conference which will cover 3 days, February 1, 2, and 3 (Social Hygiene Day). Headquarters will be the Hotel Astor.

SAFETY CAMPAIGN

IT has been announced by the National Safety Council that a \$25,000 contribution to traffic safety has been made.

The Automotive Safety Foundation will use the gift for additional and personal awards in the 1937 National Traffic Safety Contest conducted by the National Safety Council. The contest ended December 31 and prize winning cities and states will be announced early in April.

Twelve police officers and eight traffic engineers will be selected from the prize-winning cities and states in the Council's contest and sent to Northwestern and Harvard Universities for a year's training in traffic safety.

* Fellow A.P.H.A.

† Member A.P.H.A.

MILITARY SURGEONS MEETING

THE next annual meeting of the Association of Military Surgeons will be held at the Mayo Clinic, Rochester, Minn., October 13-15.

The meeting will be held in conjunction with the Medico-Military Inactive Duty Training Unit, which is under the auspices of the Mayo Foundation. This unit is composed of several hundred medical officers, active and reserves, of the Army, Navy, U. S. Public Health Service, National Guard, and Veterans' Administration.

UNIVERSITY OF ILLINOIS BUILDING
READY

THE new building containing the medical and dental laboratories of the University of Illinois has been completed and occupied.

Seven of the 15 floors are devoted to the medical facilities and the rest to the dental clinics. The building connects through corridors with a similar unit entirely occupied by the medical school and with the Illinois Research and Educational Hospital, which supplies the patients and nurses. A cancer clinic is being prepared in the basement, with \$300,000 already appropriated for radium and equipment, it is reported.

David J. Davis, M.D.,[†] is Dean of the Medical School; Frederick B. Noyes, D.D.S., of the Dental School; and Major H. Worthington, M.D., is in charge of the research and educational hospital.

METABOLIZED VITAMIN D MILK

THE Council on Foods of the American Medical Association have voted to accept pasteurized metabolized vitamin D milk and to grant use of the seal of acceptance to licensed dairies that conform to rules and regulations of the council.

Metabolized vitamin D milk is produced under the joint sponsorship of

Standard Brands, Incorporated, and the Wisconsin Alumni Research Foundation. The irradiated dried yeast intended for use in the feeding of cows may be sold by Standard Brands, Incorporated, only to dairymen licensed by the Wisconsin Alumni Research Foundation. The approved feeding schedule is made a part of the license agreement and before a license is issued the dairyman must present a statement from his local health department, medical milk commission, or other official milk control body to the effect that he is responsible, in good standing, and qualified to produce the milk under proper conditions.

The vitamin D content of the milk produced, as shown by repeated bioassays, is not less than 400 units of vitamin D per quart. The requirements and allowable claims for metabolized vitamin D milk are the same as for other types of vitamin D milk containing 400 U.S.P. units of vitamin D per quart.

RHODE ISLAND ASSOCIATION OFFICERS

AT the Third Annual Meeting of the Rhode Island Public Health Association, held January 11, new officers were elected as follows:

President—Albert Vandale, M.D., Pawtucket

First Vice-President—Fenwick Taggart, M.D., East Greenwich

Second Vice-President—George L. Salisbury, M.D.,* North Kingstown

Secretary and Treasurer—Michael J. Nestor, M.D.,[†] Providence

Corresponding Secretary—Morris L. Grover, M.D., M.P.H.,* Providence

Executive Council—C. H. Bryant, Tiverton; James P. O'Brien, M.D.,[†] Woonsocket; Daniel S. Latham, M.D.,[†] Cranston; Edward A. McLaughlin, M.D.,[†] Providence.

KIWANIS HEALTH SERVICE

ACCORDING to the *Journal of the American Medical Association*, the Florida District Convention of Kiwanis

* Fellow A.P.H.A.

† Member A.P.H.A.

International at St. Augustine has adopted a resolution making the creation of full-time health service through the county unit plan and under the supervision of the State Board of Health one of the major projects of Kiwanis. The resolution suggested that the plan be recommended and sponsored before Kiwanis International as a national project.

SKIN IRRITANTS REPORT AVAILABLE

HENRY FIELD SMYTH, M.D., Dr.P.H.,* of the University of Pennsylvania, Philadelphia, has prepared a report representing a combination of the last three Skin Irritants reports presented to the Industrial Hygiene Section, A.P.H.A., and covering a 9 year period from 1926 to 1934, completely indexed by author and subject. Dr. Smyth offers to loan this copy to those interested, provided they are willing to pay postage both ways and will return the copy within two weeks.

BIBLIOGRAPHY ON VOLATILE SOLVENTS

J. J. BLOOMFIELD, B.S.,* Chairman of the Industrial Hygiene Section, A.P.H.A., has announced that the 78 page Bibliography on Volatile Solvents presented at the 66th Annual Meeting in New York City by Henry Field Smyth, M.D., Dr.P.H.,* of the University of Pennsylvania, can now be supplied in limited numbers of copies by the Industrial Hygiene Section of the U. S. Public Health Service. This report includes a review of the literature for 1934-1936, together with an annotated bibliography.

NEGRO STUDENTS' TUBERCULOSIS STUDY

A STUDY of the health services for Negro college students in ten states has been started by Dr. Paul B. Cornely,† director of student health service of Howard University, Washington, D. C. The study, which is being sponsored by the National Tuberculosis Association, will take Dr.

Cornely to Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Tennessee, Kentucky, Maryland and Pennsylvania.

Coöperating with Dr. Cornely in his study will be the tuberculosis associations, health officers and educators in the states visited.

ORDER OF MERIT AWARDS

THE Order of Merit of Carlos Finlay was recently conferred on the following members of the faculty of Cornell University Medical College, New York, N. Y., as a recognition of their medical and public health services to Cuba:

Dr. Henricus J. Stander
Wilson G. Smillie, M.D.*
Dr. Foster Kennedy
Edgar Mayer, M.D.†
Morton C. Kahn, Ph.D.†

WATER PLANT MANUAL

THE Texas Division of the Southwest Section, American Water Works Association, announces that a manual for the guidance of water plant operators, sponsored by the Section, has been prepared and will be on sale by the middle of February.

This volume will be reviewed in the *American Journal of Public Health*.

INDIANA'S NEW HEALTH UNITS PERMANENT

THE Indiana State Department of Health recently announced that the 4 district health units established during the flood at Princeton, Huntingburg, New Albany, and Rising Sun have been placed on a permanent basis.

A new district department was set up recently at Bloomington, including Monroe and Brown Counties. Later it is expected that Johnson, Lawrence, and Morgan Counties will be added to this district.

* Fellow A.P.H.A.

† Member A.P.H.A.

COURSES IN EDUCATION OF THE
HANDICAPPED

TEACHERS College, Columbia University, New York, offers for the year 1938-1939 a limited number of scholarships and teaching fellowships for graduates of normal schools and colleges and for teachers now in service in fields of the handicapped who wish to continue their study programs in a combination of courses given at Teachers College.

Scholarship awards may include tuition, maintenance, and cash stipends. The amount of the stipend will vary with the individual case.

Application forms for scholarships and fellowships may be obtained by writing to Professor Merle E. Framp-ton, Teachers College, Columbia University, 525 West 120th Street, New York, N. Y. Applications must be filed not later than May 1, 1938.

CHARLES HERBERT LA WALL

CHARLES Herbert La Wall, Phar.D., Sc.D.,* distinguished pharmacist and chemist, Dean of Pharmacy of the Philadelphia College of Pharmacy and Science and Senior Member of LaWall and Harrison, Consulting Chemists of Philadelphia, Pa., died December 7, 1937, at the age of 66.

Dr. LaWall was connected with the *United States Dispensatory*, beginning as associate editor in 1909 on the 20th edition and continuing as co-author with Dr. Horatio C. Wood, Jr., upon the 21st, and of the recent 22nd edition of this standard reference work. He likewise served as a co-author of the 7th and 8th editions of *Remington's Practice of Pharmacy* with Dr. E. Fullerton Cook. He wrote the historical volume, *Four Thousand Years of Pharmacy; An Outline History of*

Pharmacy and the Allied Sciences, which has come to be regarded as a standard reference work on chronology of this branch of science.

He was appointed United States Representative on the League of Nations International Committee for Assaying Opium; he received the Remington Medal from the American Pharmaceutical Association in 1927; was President of the American Pharmaceutical Association in 1919, and President of the Pennsylvania Pharmaceutical Association in 1911. He served in a similar capacity to the American Association of Colleges of Pharmacy in 1923, and during the World War was a member of the War Industries Board.

ECONOMIC LOSSES IN PREVENTABLE
DISEASE

THE following quotations are taken from Dr. Thomas Parran's address before the Association of Life Insurance Presidents, December 2, 1937:

Sickness and death rates of previous years are inadequate as yardsticks for the present. Rather than to say the health of the nation is good, it is more accurate to say the health of the nation is better than the distressingly high rates of past years. To stand still in public health is to regress. Public health is a dynamic science. It is extending the horizon of knowledge year by year . . . Give us a weapon for combating a new disease and medicine has a responsibility for seeing that it is used.

It is possible, by applying the public health knowledge we now have, to cut down greatly the economic losses caused by the preventable diseases. The monetary saving resulting from the prevention of these causes of illness and death would begin immediately. The accumulation of savings in a generation would be vast. It would amortize the money spent to effect this economy. It is far less expensive to control these diseases than to continue to pay tax money, charity, personal savings, and sound insurance dollars for the needlessly sick and the premature dead.

* Fellow A.P.H.A.

* Member A.P.H.A.

PERSONALS

Central States

LESLIE V. BURKETT, M.D.,† of Midland, Mich., formerly Health Officer of Midland County, has been appointed Health Officer for Genesee County.

ROBERT C. FARRIER, M.D.,† who recently resigned as Director of the Delta County Health Department with headquarters in Escanaba, Mich., will take charge of the new Illinois State Department of Health district health unit to include East St. Louis, Centerville, Canteen, and Stites, with headquarters in East St. Louis.

DR. THOMAS E. GIBSON, of Flint, Mich., recently resigned as Health Officer of Genesee County to accept a similar position in Eaton County, to succeed DR. JOSEPH W. DAVIS, resigned.

G. HOWARD GOWEN, M.D.,† has resigned as Assistant to the Chief, Division of Communicable Diseases, Illinois State Department of Health, Springfield, Ill., to direct the new public health unit comprising Champaign and Urbana, Ill. The new health district will replace the former separate health activities in the two townships.

DON W. GUDAKUNST, M.D.,* has been appointed Health Commissioner of the State of Michigan, effective January 3. Dr. Gudakunst has served for the past 8 years as Deputy Health Commissioner of the Detroit Department of Health, with which organization he has been associated for the past 14 years. As State Commissioner of Health of Michigan, he succeeds C. C. SLEMONS, M.D.,* of Grand Rapids.

DR. VAUGHN L. HARTMAN, of Medina, Ohio, resigned as Health Commis-

sioner of Medina County recently, to become Assistant Health Commissioner of Cuyahoga County.

DR. WILLIS L. JACOBUS, JR., of Ottawa, Kans., has been appointed Health Commissioner of Franklin County, to fill the unexpired term of his father, the late DR. WILLIS L. JACOBUS.

LORAN E. ORR, M.D.,† formerly of Greenview, Ill., has been appointed Coördinating Epidemiologist to the State Department of Health, Springfield.

DR. JACOB A. PINSKER, of Wichita, Kans., has been appointed Health Officer of Reno County, Kans., succeeding DR. LEE O. FORNEY, who resigned after 19 years to enter private practice.

DR. CHARLES M. STARR, of Larned, Kans., has been appointed Health Officer of Pawnee County.

DR. WILLIAM B. TURNER II, of Wooster, Ohio, has been appointed to succeed DR. EDWARD M. THOMPSON, of Munfordville, Ky., as Health Officer of Hart County, Ky.

Eastern States

ARTHUR H. CUMMINGS, M.D.* formerly at Saranac Lake, N. Y., has been transferred to Binghamton as New York State District Health Officer.

H. BURTON DOUST, M.D., has been appointed Commissioner of Health of Syracuse, N. Y., succeeding GREGORY D. MAHAR, M.D.†

RAYMOND D. FEAR, M.D., DR.P.H.,* Health Officer of Stamford, Conn., has been appointed District Health Officer on the staff of the New York State Department of Health, in charge of the Tompkins County District.

DR. EDWARD E. HALEY, of Buffalo, N. Y., has been appointed Deputy Commissioner of Health and Director of the Division of Communicable Dis-

* Fellow A.P.H.A.

† Member A.P.H.A.

eases in the Buffalo Health Department, succeeding the late DR. CHARLES A. BENTZ.

DR. AUGUSTUS J. HAMBROOK, Troy, N. Y., was recently appointed a member of the New York State Advisory Council on Health and Physical Education in Public Schools, succeeding DR. FLOYD S. WINSLOW, of Rochester.

ERNEST M. MORRIS, A.B., M.D., C.M.,* Commissioner of Health of Fall River, Mass., for 8 years, has resigned to join the staff of the Harvard School of Public Health, Harvard University, Boston, Mass.

DR. FREDERICK F. RUSSELL, Professor of Preventive Medicine and Epidemiology and Hygiene, Harvard University Medical School, Boston, Mass., was recently awarded the Buchanan Medal of the Royal Society of England, for his work in relation to public health problems on behalf of the International Health Division of the Rockefeller Foundation. Dr. Russell was General Director of the Division from 1923 to 1935.

Southern States

HUGH B. COTTRELL, M.D., C.P.H.,† of Indianola, Miss., since 1935 Director of the Sunflower County Health Department, has been appointed as Director of the field unit which supervises the programs of the county health units for the Mississippi State Board of Health.

SAMUEL REED DAMON, Ph.D., became Director of Laboratories for the Alabama State Department of Public Health on January 1. Dr. Damon was graduated from Brown University in 1916 with a Ph.D. degree from the same institution in 1921. Since his graduation he has been connected with the De-

partment of Bacteriology in the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, first as instructor and, since 1927, as Associate Professor.

DR. JULIUS E. DUNN, of Fort Payne, Ala., for 2 years Health Officer of DeKalb County, has been appointed Health Officer of Lauderdale County, with headquarters in Florence.

DR. FORREST S. ETTER, of Bartlesville, Okla., has been appointed Health Superintendent of Washington County.

DR. CHARLES R. GILLESPIE, of Natchez, Miss., Health Officer of Adams County, has been appointed as Director of Health in Sunflower County.

DR. GILES E. HARRIS, of Hugo, Okla., has been appointed Health Superintendent of Choctaw County, to succeed DR. WALTER N. JOHN, of Hugo.

DR. ANDREW HEDMEG, formerly of Lexington, Miss., has been appointed Health Officer of Adams County, with headquarters at Natchez, Miss.

DR. JAMES W. McMURRAY has been appointed Director of the Broward County Health Unit, with headquarters at Fort Lauderdale, Fla., succeeding PAUL G. SHELL, M.D.,† who has entered private practice in Tampa. Dr. McMurray was formerly Director of the Gulf-Calhoun-Franklin unit, with headquarters at Apalachicola.

DR. THOMAS E. MORGAN, Health Officer of Pinellas County, Fla., with headquarters in Clearwater, has been appointed Regional Medical Consultant to the Children's Bureau of the U. S. Department of Labor for the Southeastern District. Dr. Morgan will have his headquarters in Washington, D. C. The Southeastern District includes: District of Columbia, Delaware, Virginia, West Virginia, Georgia, Florida, North Carolina, and South Carolina.

* Fellow A.P.H.A.

† Member A.P.H.A.

DR. ORVAL L. PARSONS, of Lawton, Okla., has been appointed Health Superintendent of Comanche County, to succeed DR. LORIN C. KNEE, of Lawton.

EUGENE C. PECK, M.D., M.P.H.,† of Oakland, Md., Health Officer of Garrett County, has been appointed Health Officer in St. Mary's County, the change to take effect when his successor will be named.

RICHARD H. SHRYOCK, PH.D., Professor of History, Duke University, Durham, N. C., recently received the Mayflower Cup awarded by the North Carolina State Literary and Historical Association in Raleigh, for his book "The Development of Modern Medicine," chosen as the "outstanding book by a resident of the state this year."

SAMUEL D. STURKIE, M.D.,† formerly of Oneonta, Ala., has been appointed Health Officer of Chilton County, succeeding JOHN M. KIMMEY, M.D., M.P.H.,† of Clanton, who resigned to become Health Officer of Calhoun County.

DR. EDWARD M. THOMPSON, of Munfordville, Ky., has resigned as Health Officer of Hart County, to take a similar position in Logan County. He will be succeeded by DR. WILLIAM B. TURNER II, of Wooster, Ohio.

Western States

ORVILLE H. BROWN, M.D., PH.D.,† of Phoenix, Ariz., has resigned as Editor of *Southwestern Medicine*.

JAMES S. CULLYFORD, M.D.,† of Denver, Colo., has been appointed Director of the newly created Division of Rural Health Work and Epidemi-

ology of the Colorado State Board of Health.

DR. NORMAN E. MAGNUSSEN, formerly with the Health Department of Seattle, Wash., has been appointed Health Officer of Pierce County.

DR. HOWARD L. McMARTIN, recently appointed Health Officer of the Twin Falls District, has been made head of the Division of Maternal and Child Welfare in the Idaho State Department of Health.

FRANK S. MORRISON, LL.B., has been appointed Director of Vital Statistics of the Colorado State Board of Health.

DR. ROBERT B. STUMP, formerly of Cleveland, has been appointed Health Officer of the Twin Falls, Idaho, Health District, to succeed DR. HOWARD L. McMARTIN.

Canada

ROY B. JENKINS, M.D., D.P.H.,† Lecturer in Public Health at the University of Alberta and Medical Officer of Health of the City of Edmonton, Alta., has resigned to become Chief of the Division of Epidemiology in the federal Department of Pensions and National Health.

GEORGE M. LITTLE, M.D., D.P.H.,† of Red Deer, Alta., has been appointed Health Officer of Edmonton.

DEATH

FRANK WILCOX PINNEO, M.D., of Newark, N. J., Secretary of the Essex County Medical Milk Commission, and Secretary of the Essex County Medical Society for the last 20 years, died November 18. Early in his career he became intimately associated with Henry L. Coit, the originator of certified milk, and devoted himself through the rest of his life to the advancement of the interests of certified milk.

† Fellow A.P.H.A.
* Member A.P.H.A.

CONFERENCES AND DATES

- American Academy of Tuberculosis Physicians. San Francisco, Calif. June 13-14.
- American Association of Medical Social Workers. Seattle, Wash. June 26-July 2.
- American Association of Pathologists and Bacteriologists. Atlantic City, N. J. May 3-4.
- American Association of Psychiatric Social Workers. Seattle, Wash. June 26-July 2.
- American Association of Railway Surgeons. Chicago, Ill. September, 1938.
- American Chemical Society. Dallas, Tex. April 18-21.
- American College of Physicians, Waldorf-Astoria Hotel, New York, N. Y. April 4-8.
- American Home Economics Association. Pittsburgh, Pa. June 28-July 1.
- American Institute of Nutrition. Johns Hopkins University—School of Hygiene and Public Health. Baltimore, Md. Spring, 1938.
- American Medical Association. San Francisco, Calif., June 13-17.
- American Orthopsychiatric Association. Chicago, Ill. February 24-26.
- American Physicians' Art Association—First National Exhibition. San Francisco Museum of Art, San Francisco, Calif. September, 1938.
- American Public Health Association. Kansas City, Mo. October 25-28.
- American Roentgen Ray Society. Atlantic City, N. J. September 20-23.
- American Social Hygiene Association—New York Regional Conference. Hotel Astor, New York, N. Y. February 1-3.
- American Society of Clinical Pathologists. San Francisco, Calif. June 9-11.
- American Veterinary Medical Association. New York, N. Y. July 5-9.
- American Water Works Association. Hotel Roosevelt, New Orleans, La. April 24-28.
- Annual Congress on Medical Education and Licensure. Palmer House, Chicago, Ill. February 14-15.
- Association for the Study of Allergy. San Francisco, Calif. June 13-14.
- Association for the Study of Internal Secretions. San Francisco, Calif. June 13-14.
- Association of Foods and Drug Officials of South Central States. Biloxi, Miss. May, 1938.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13-15.
- Association of Western Hospitals. San Francisco, Calif. February 28-March 3.
- California Association of Dairy and Milk Inspectors. Santa Barbara, Calif. September.
- California Association of Health, Physical Education and Recreation. Pasadena, Calif. April 18-19.
- California Conference of Social Work. Pasadena, Calif. April 24-28.
- California Medical Association. Pasadena, Calif. May 9-12.
- Central Physical Education Association. Minneapolis, Minn. March 30-April 2.
- Congress of American Physicians and Surgeons. Atlantic City, N. J. May 2-6.
- Congress of Parent-Teachers Association. Battle Creek, Mich. April 20-22.

- Dairy Products Association of the Northwest. St. Paul, Minn. April, 1938.
- Federation of State Medical Boards of the United States. Palmer House, Chicago, Ill. February 14-15.
- Georgia Public Health Association. Atlanta, Ga. May, 1938.
- Hawaii Territorial Medical Association. Honolulu, T. H. May, 1938.
- Hay Fever Association of America. Sault Ste. Marie, Mich. August 10-September 20.
- Hermann Michael Biggs Lecture—Annual. Subject, "Virus Diseases," Speaker, Thomas M. Rivers, M.D. New York Academy of Medicine, New York City. April 8 (8:30 P.M.).
- Illinois Dairy Products Association. Springfield, Ill. February 22-24.
- International Association for Dental Research. Minneapolis, Minn. May 12-13.
- International Association of Medical Museums—American and Canadian Section. Atlantic City, N. J. February 28-March 2.
- Iowa Public Health Association. Des Moines, Ia. May, 1938.
- Iowa Tuberculosis Association. Ottumwa, Ia. March, 1938.
- Manufacturing Chemists Association of the United States. Sky Top, Pa. June 2-3.
- Medical Library Association. Boston, Mass., June, 1938.
- Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13-15.
- Mississippi Valley Conference on Tuberculosis. St. Louis, Mo. October 1-3.
- National Association for Educational Publicity. Atlantic City, N. J. February 26-27.
- National Conference of Social Work. Seattle, Wash. June 26-July 2.
- National Conference on Weights and Measures. Washington, D. C. June, 1938.
- National Education Association. New York, N. Y. June 26-30.
- National Negro Health Week. March 27-April 2.
- National Tuberculosis Association. Biltmore Hotel, Los Angeles, Calif. June 20-23.
- New England Hospital Association. Boston, Mass. March 10-12.
- New Mexico Public Health Association. Albuquerque, N. M. June, 1938.
- Ohio Federation of Public Health Officials. Columbus, Ohio, April, 1938.
- Pennsylvania Public Health Association. Harrisburg, Pa. May, 1938.
- Polish Medical and Dental Association of America. Pittsburgh, Pa. August, 1938.
- Public Health Association of New York City. New York. April, 1938.
- Social Hygiene Day, Second National. Theme, "Stamp Out Syphilis—Foe of Youth." February 3.
- Social Work Publicity Council. Seattle, Wash. June 26-July 2.
- South Carolina Public Health Association. Myrtle Beach, S. C. May 23-25.
- Symposium on Higher Education in the South. Vanderbilt University, Nashville, Tenn. February 5.
- Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2-9, 1939.
- Western Branch, American Public Health Association. Hotel Multnomah, Portland, Ore. June 6-8.

FOREIGN

- World Conference on Leprosy. International Leprosy Association. Cairo, Egypt. March 21.
- American Water Works Association—Canadian Section. Windsor, Ont., Canada. March 23-25.

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

March, 1938

Number 3

Mental Hygiene and the Health Department*

ALLEN W. FREEMAN, M.D., F.A.P.H.A.

*School of Hygiene and Public Health, The Johns Hopkins
University, Baltimore, Md.*

IT has long been contended that activities for the promotion of mental hygiene should be incorporated into the program of operations of official departments of health. Propaganda to this end has been active and sustained. It is urged, and with truth, that the protection of mental health is as important as the protection of physical health; that mental disease is a large and growing problem of tremendous economic and social importance; and that health departments are the logical and, in fact, the only agencies capable of conducting certain phases of the program. In spite of this vigorous and long continued propaganda, health departments have been slow in undertaking definite programs of activity in mental hygiene. There have been, of course, exceptions, but in general the subject has not actively interested many of our health officers and health workers.

No small part of the difficulty in

securing the incorporation of mental hygiene into the health program is due to the indefiniteness and confusion which surround the term "mental hygiene" itself. When we speak of the prevention of infant mortality, the promotion of maternity hygiene, or the prevention of tuberculosis, speaker and hearer alike have a reasonably clear and uniform conception of what is meant by the terms used. When we speak of mental hygiene, however, we may be considering either the need for improvement in the diagnosis and treatment of frank cases of mental disease, or an argument for broad sociological and economic changes which will reduce the pressure of anxiety or worry of the individual, and thus enable persons to maintain mental health who under existing circumstances break down. Between these extremes, perfectly definite clinical procedures on the one hand, and the broad and wishful thinking in economics and sociology on the other, are to be found a wide variety of ideas and procedures, all of which have the common aim of attempting to reduce the prevalence of mental disease in the

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

community and to improve the chances of cure of those persons who may be attacked.

From the standpoint of the health department, therefore, to pick out from this congeries of ideas, hopes, and procedures, those things which are capable of incorporation into the program of a health department, has been by no means easy. Any preventive measure must, before it may be incorporated into the health program, conform to certain fairly well defined criteria. The procedure must first of all be really preventive rather than curative. Our health departments are not yet to the point where they can undertake the administration of purely clinical procedures not definitely preventive in nature. The procedure must be capable of general application, and be effective for the whole population. It must be capable of effective application at a reasonable cost. The total amounts of money available to our health departments are small at best, and the prospects of large additions to those funds are not great. Equally important, our procedures must be capable of application by personnel which is available in sufficient numbers to man the organization required. A public health procedure which can be carried on only by exceptionally gifted personnel, and of the highest qualifications, cannot hope for general application by health departments.

Many of the ideas included in the general term "mental hygiene" conform to those requirements. Mental hygiene is in large part still a matter of improved clinical service to the individual. Early recognition, skillful diagnosis, and effective treatment are by far the most important of the procedures now available. Preventive procedures other than those which depend upon wide economic and social change, are not commonly to be found in mental hygiene programs. Most of the pro-

cedures which have up to now been suggested are highly expensive and are capable of application only to small groups. Therefore, some of the difficulties which have been encountered in promoting the conduct of mental hygiene procedures are to be explained by these facts.

The prevention of mental disease rests on no such simple and well understood principles as those which underlie the prevention of communicable disease or the promotion of maternal and infant hygiene. It has as yet developed no simple and effective administrative technic. If the technics of preventive medicine are to be applied to mental disease, those phases of the problem capable of successful attack by these technics must be selected from the whole body of mental hygiene procedures and special personnel developed for their application.

The question of personnel is highly important. It is too much to expect that psychiatrists, however skilled they may be clinically, will develop these administrative procedures. The technics of public health are not unduly complicated or difficult. They are, however, special; peculiar to the field of preventive medicine. They must be mastered, if effective prevention is to be accomplished, whether the problem of disease be physical or mental. If our health departments are actively to enter the field of mental hygiene, a new type of personnel must be developed, familiar both with psychiatry and with public health methods, and these new workers must develop a new administrative technic.

Surveying the field of mental hygiene with a view to discovering problems capable of successful attack by preventive measures, it is evident that the conduct of purely clinical psychiatric procedures, whether for in-patients or out-patients, is not a task for which our health departments are designed or

organized, and there is no apparent reason why it should be given to them. Whether or not the field nursing activities auxiliary to such clinical services can be carried on by the nursing staff of our health departments, is exceedingly doubtful. All psychiatric experience seems to indicate that such nursing personnel must be highly trained and especially skilled, and that their activities are difficult and time consuming. To expect such new duties of our public health nurses, already heavily overburdened in both the amount and variety of work expected of them, seems out of the question.

It is in our school medical services that we recognize our first need for participation by health departments in mental hygiene activities. The addition of psychological and psychiatric activities to school medical services, where these are under the control of health departments, is highly necessary. The weeding out of the mentally retarded from the regular classes and the early diagnosis of the symptoms of beginning mental disturbances, in children and in teachers alike, is a truly preventive procedure of an importance far greater than the early detection of defects of the eye or ear. It is capable of incorporation into the school health program without difficulty.

It is perhaps in the schools and in infant welfare work that the largest immediate, potential field of usefulness of the health department is to be found. Our infant welfare service as at present organized maintains regular contact between physician and child for a large proportion of the child population in our cities, and in certain rural areas. The importance of the mental hygiene component of child welfare is, of course, undoubted. In our opinion, it is here that the preventive aspects of mental hygiene must be undertaken, if at all, by the department of health. The so-called child guidance clinics, or habit

clinics, represent a difficult, expensive, and not highly successful effort to remedy defects in early mental training. Much of the work of our mental hygiene clinics and hospitals is likewise devoted to an attempt, often unsuccessful, to cure conditions which might have been prevented in the beginning. It would seem highly desirable, therefore, that an effort be made toward the prevention of these conditions before they arise.

This might conceivably be brought about by an increase in the activity of our existing staff of pediatricians and nurses in the habit training for very young children. If every clinic physician were impressed with the importance of the matter and made it a routine part of his work with mothers at the welfare clinic, and if our nurses were sufficiently interested in the subject to assist mothers in the home in the training of children, the desired result might be accomplished. This addition to the existing program of our welfare clinics will not be easy to secure, but if health administrators are genuinely interested, results will undoubtedly come in time.

The alternative procedure of adding a psychiatrist to the staff of the clinic for the purpose of assisting mothers in the training of children, encounters immediately the difficulties of expense and of the fact that personnel is not available at this time for such service. That this service can be made an integral part of the work of child welfare clinics, and that it is welcomed by the mothers to whom it is offered, has already been well demonstrated in an experiment which has been in operation somewhat more than a year in the Eastern Health District in Baltimore.

Another possible field of development is in public health nursing. There is no doubt that the field nurses of our health departments should have sufficient familiarity with elementary psy-

chology to recognize at least marked deviations from the normal in persons encountered by them in their field service, and psychiatric consultation should be available for these cases. No one familiar with circumstances in the field will expect too much of this sort of activity. Public health nurses cannot be expected to know everything or to do everything, and we require too much of them at present. A little emphasis on the psychiatric aspects of their work, however, would probably be of great value to them in the solution of problems that they frequently encounter.

From the standpoint of the local health department, it would seem that a greater interest in the mental hygiene of the child, beginning with the earliest weeks through the service of the welfare clinic and the field nurse and continuing through school life, is a necessary and desirable thing and should be part of the development program of every department of health. The coördination between the mental hygiene clinic and the field public health nurse should likewise be developed.

In state service there should, of course, be close coöperation between the department of health and the department of mental hygiene. The local health department is the proper center for the itinerant mental hygiene clinic, and the field nurse must of necessity be the link between the clinic and the patient in the home. The principal activities of the state department of health will be in promoting this sort of coöperation in county departments of health.

Some question may be raised as to whether or not state mental hygiene clinics should be conducted by state departments of health or by mental hygiene commissions. In general, it would seem, from the standpoint of technical administrative control, that the mental hygiene commission is best adapted to the conduct of field activities in mental hygiene. The desirable relationship is probably not very different from that now prevailing between tuberculosis hospitals and local health departments.

Reviewing the field, therefore, it is evident that the health department's part in mental hygiene is still strictly limited. Within this limited field, however, there are great opportunities for useful service. Extension of the field will probably wait upon the development of personnel specially trained in preventive psychiatry.

The mental hygiene movement has suffered much from its friends and proponents. Their over-enthusiasm and their putting of propaganda so far in advance of procedure, have done much to obscure the very real importance of the subject. The coldness of practically minded health officers to it is not entirely unjustified.

The importance of the subject, the great popular interest which has been aroused in it, and the so urgent need for successful prevention, demand, however, that health officers attack the problem, develop the men and the methods needed, and prevent mental disease to the full extent to which prevention is possible.

Is There an Epidemiology of Mental Disease?*

HENRY B. ELKIND, M.D., F.A.P.H.A.

*Medical Director, Massachusetts Society for Mental Hygiene,
Boston, Mass.*

IT may be uninteresting to introduce the discussion of a subject by considering definitions, but it seems rather necessary to do so in the present instance as the science of epidemiology is not generally considered by those most concerned with it to include mental disease. I have looked over many texts and in none do I find any systematic discussion or treatment of mental disease as an epidemiological topic. In one book, *Epidemics and Crowd Diseases* by Greenwood (1935), there is a passing reference to dancing mania and similar emotional disturbances of crowds which are considered worthy of epidemiological study. The Vaughans in their textbook *Epidemiology and Public Health* (1923) define epidemiology as the science of epidemics, and state that for a disease to be considered of epidemiological concern a necessary criterion is that it be infectious, or at least possibly infectious, and further that the cause of infection be some germ or virus. A reading of Sir William Hamer's *Epidemiology: Old and New* would also lead one to the same way of looking at

epidemiology. A break with the need of requiring infection by germ or virus is made by Greenwood in the text mentioned above. We quote him as follows:

Epidemiology came to mean the study of diseases, any disease, as a mass phenomenon. It differs from the study of disease by a clinician primarily in respect of the unit of investigation. A physician is concerned with, say, typhoid fever from the point of view of the individual patient, to determine from his experience and the results of his examination (a) that the patient is suffering from typhoid fever, (b) how the case is likely to develop—its prognosis, (c) what treatment is likely to give the patient the best chance of recovery. An epidemiologist is concerned with a prevalence of typhoid fever; he wishes to determine the probable course of that prevalence, whether there are likely to be more cases, when the maximum will be reached, what should be done to reduce the prevalence. The physician's unit of study is a single human being, the epidemiologist's unit is not a single human being but an aggregate of human beings, and since it is impossible to hold in the mind distinctly a mass of separate particulars he forms a general picture, an average of what is happening, and works upon that (page 15).

Because of Greenwood's non-insistence upon an infectious *materies morbi*, he is able to include a whole chapter on cancer. Although it is perhaps the least valuable chapter in the book (because at the time it was written very little of definite epidemiological value about cancer had been deduced), nevertheless it is worthy of note because

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937. Only part of this paper as delivered is published in this issue. The remaining part dealing with the discussion and presentation of specific pieces of statistical and epidemiological work in the field of mental disease may be available later.

it means that epidemiology need not be limited to those diseases caused by some form of infectious agent. Greenwood's book, however, has no chapter on mental disease. So far as I have been able to find in the literature, there is no systematic work dealing with this important class of diseases.

My first conception of an epidemiology of mental disease came from Dr. Milton J. Rosenau, formerly Professor of Preventive Medicine and Hygiene at the Harvard Medical School and School of Public Health. When I was a student of his in 1923-1924, I heard him state that there was an epidemiology of mental disease, even though this was not generally recognized. As a matter of fact, in his department at least one worker was giving his full attention to the epidemiological study of mental disease.

The social and economic importance of mental disease warrants its being included in a science of epidemiology. This no one can doubt. Statistics show that more than one-half of all beds devoted to the care and treatment of disease throughout the country are filled by patients suffering from some form of mental disease. This fact alone entitles it to be a prime concern of public health. When we realize that a good part of the population residing outside of hospital walls suffers from some form of mental disease or disorder, this primacy cannot be challenged.

One might ask how has it come about that a factor of such importance to the public health failed to be included in the science of epidemiology. One of the reasons is perhaps that from early days public health departments have dealt with communicable diseases while other branches of government have had the care and treatment of mentally diseased persons. Undoubtedly another reason is the taboo that has surrounded mental diseases, a taboo which has in part resulted from the Christian atti-

tude toward the body-mind problem, the body being the concern of the physician and the mind of the church. Possibly another reason is the fact that it is only recently that psychiatry has been seriously interested in the matter of the control and prevention of mental disease, chiefly through the influence of the modern mental hygiene movement. A further reason may be the confusion which one may note in current psychiatry as to the nature and origin of mental disease.

For the past 20 or 30 years psychiatrists have been divided into various schools differing mainly in their way of looking upon etiology. These may be roughly classified as (1) the organic, (2) the psychological, and (3) the eclectic, this last having characteristics of the first two.

The organic school stresses etiology, with a noxious agent or organic change as being the prime cause of mental disease. The psychological school and to a considerable extent the eclectic school look upon mental disease rather as the various abnormal ways in which human beings react to difficult situations in life. These difficulties may be inheritance in terms of defective germ plasm, or noxious agents such as infectious metabolic and external poisons, or they may be psychic trauma, mental conflicts, trying situations, and the like. Each individual is looked upon as unique, with a personality which is the resultant of a constitution developing in a continuing series of experience from birth to death. Man is a gregarious individual, and one of the risks of life is the hosts of possible trauma coming about from his contact with his fellow men. He is not only a physical being but a feeling and thinking individual. In terms of present-day philosophy he is not to be looked upon as a mere machine reacting mechanically to internal and external stimuli but as an organism capable of creating

new reactions in response to the various stimuli of existence.

Perhaps an example cited here will help to clarify my discussion at this point. Two individuals may have an influenza infection. One has chiefly pulmonary symptoms, together with the usual mental depression and the general aches and pains which go with the disease. The second has as his main symptom-complex the so-called schizophrenic reaction—a special type of abnormal mental picture. I do not need here to enter into a description of this type of reaction, except to state that it represents in terms of the psychiatrist a splitting of the psyche, a bizarre reaction of the individual, resulting from the disintegrating effects of the toxins of the influenza infection upon the brain. For the group of psychiatrists belonging to the organic school, it is enough to note that we have a psychosis, a mental disease with a certain mental picture, the direct result of an influenza infection. For the other two groups of psychiatrists, it is more important to note the particular way in which the individual reacts to this toxic agent, to note the kind of mental picture and behavior that results, the kind of personality he had before the onset of the infection, and, what is most important, how the patient came to behave that way and to develop a psychosis. In other words, the more modern schools of psychiatry are interested in the dynamics of those influences which caused a certain personality to develop a particular psychosis, and the infective agent is only one of the many influences or factors.

Undoubtedly this discussion of the differences in etiological systems may be confusing to the non-psychiatrist. Essentially this situation is not unique to modern psychiatry, as we find something similar in epidemiological discussions of the last decade or two.

Particularly Greenwood and Hamer of England make much of the point that epidemiology until recently suffered considerably from being too exclusively concerned with the significance of the single etiological agent—the bacterium or virus—and neglected what is perhaps the more important contribution of epidemiology—a concern with all of the significant and pertinent etiological factors which cause a disease to appear in a community, including hereditary influences.

The way in which medical men look upon etiology may be simply a matter of temperament; some prefer to be single etiologically-minded while others prefer to be plural etiologically-minded. This latter tendency is fundamental to much of modern psychiatry, even though we are compelled to note a paradox in the acceptance of a new classification of mental disease adopted by the American Psychiatric Association as recently as 1934 which explicitly emphasizes the single noxious agent, or organic pathology, as the main discriminating criterion of disease entities. This more recent classification exhibits this new emphasis more definitely than the first classification approved in 1916.

There is perhaps another reason why mental disease has only recently come to be recognized as a topic of epidemiological study, and that is the fact that practically the only statistics available in the field of mental disease are of hospital population, in contradistinction to statistics from community populations of communicable diseases and the other physical diseases. Statistics of hospital populations are quite apt to suffer from administrative and legal practices which tend to vary from locality to locality as well as in time. This dependence upon hospital statistics leads one to lean too heavily and too exclusively upon the use of proportionate morbidity as the usual type of

statistical analysis, and this our statistical friends state is a dangerous practice when one uses these statistics for the purpose of inference.

When a man dies, there is no question about it, but there may be some question about the disease to which he succumbed. In many instances there is even more question as to what particular ailment a person is suffering from. The death certificate takes pretty good care of the first two categories, while the latter is quite dependent upon the vagaries of the reporting physician. It may be true, however, that because of the nature of the more serious mental diseases, we get a better picture of the incidence of mental disease from hospital statistics because of the necessity of the incarceration of these patients in a hospital for mental diseases. This picture may be found, however, only in those state administrations where the facilities for care and treatment are adequate and where popular opinion and medical coöperation favor the admission of patients to mental hospitals. This means, therefore, that there are only a few states whose statistics are fairly reliable from this point of view. There may also have been suspicion in the minds of some epidemiologists that some of the statistics available in the annual reports of state hospital administrations and particular institutions may not have been properly presented or prepared. The recent work of Dayton in Massachusetts, some of it unpublished, demonstrates this.

I might venture one final reason for the late interest by epidemiologists in mental disease as being that much of the factual material involves more or less intangible concepts, because psychiatry, dealing so much with the mind, must perforce concern itself with subjective experience, which is so difficult for scientific study and analysis. For example, sex in a statistical sense offers

no difficulty at all to the statistician, but the complicated concepts of the development of the libido are perhaps too much and too difficult for him. Another example may be given as follows: The epidemiologist in the field of communicable disease has generally little trouble with the determination of the onset of an attack of disease, but when one comes to the determination of the onset of a case of schizophrenia, it is one thing if one is a Kraepelinian, another if one is a Meyerian, and still another if one adheres to the psychoanalytic school. This difficulty with etiology, however, is not limited to psychiatry. It is to be noted more particularly in the field of chronic physical diseases, such as chronic nephritis, arthritis, cardiac disease, etc.

Up to this point the discussion has been more or less aimed at demonstrating that mental disease is a proper concern of epidemiology and giving reasons to explain why it has only very recently come to be considered worthy of attention by epidemiologists.

The balance of my discussion will cite a few important facts in the history of the epidemiology of mental disease, even though it be a recent and short one. This is done to further the thesis that there is an epidemiology of mental disease by demonstrating that actual work has been and is being done in this field. (A second paper, which may be available later, would do this more definitely.) Before going further I wish to make it plain that I differentiate between administrative statistics and such statistics as have been utilized for a definite epidemiological purpose. The reason for mentioning this is that so much of state hospital statistics are gathered and prepared just with administrative objectives in mind.

It is difficult to state exactly when statistical information was prepared

and made available and studied from an epidemiological point of view. It is my opinion that the best way to answer this question would be to say that the epidemiology of mental disease started in 1916 with the acceptance of the first classification of mental disease adopted by the American Psychiatric Association and the National Committee for Mental Hygiene. The person to be given credit for this pioneer development in the epidemiology of mental disease is Horatio M. Pollock, Statistician of the New York State Hospital Commission. He also became the first Director of the Bureau (later called Department) of Statistics of the National Committee for Mental Hygiene. Dr. Pollock's influence extended still further in connection with the Federal Census as he was largely responsible for the development of that section that deals with mental disease.

From 1916 to about 1928, the State of New York held the foremost position in this field. Of course, here and there isolated writers discussed some forms of mental disease in an epidemiological way, but what is meant here is any systematic, continued attack on the problem. About 1928, Massachusetts, under the leadership and stimulus of the late Dr. George M. Kline, then State Commissioner of Mental Diseases, offered the most elaborate and serious attack on the problem to be noted in this country.

With funds made available by the state and by the Rockefeller Foundation, a very large and competent research statistical department was organized under the direction of Dr. Neil A. Dayton, whose many contributions to the epidemiology of mental disease and defect are well known.

Almost coincident with the development of this work in Massachusetts came somewhat similar attempts, particularly in the State of New York

under the joint auspices of the Statistical Division of the State Department of Mental Hygiene and the New York State Committee on Mental Hygiene of the State Charities Aid Association. This work was directed by Raymond G. Fuller, assisted by Horatio M. Pollock and Benjamin Malzberg. A more intensive investigation in the social factors of schizophrenia was attempted for a period of 7 or 8 years under the auspices of the Boston Psychopathic Hospital and the Massachusetts Society for Mental Hygiene.

The U. S. Public Health Service has also been interested in this field and in conjunction with the National Committee for Mental Hygiene has recently made an organized advance. The stimulus for this most recent development comes from Dr. Walter L. Treadway, Director of the Division of Mental Hygiene of the U. S. Public Health Service.

Possibly the best statistics on mental diseases in this country are now provided by the Massachusetts State Department of Mental Diseases. This department was the first to recognize the urgent necessity of preparing adequate statistics on the resident population. Before that time statistics on mental diseases had been confined to admissions, discharges, and deaths. While this analysis gave an interesting picture of the movement of the population, it overlooked the serious problem of the accumulation of mental patients within our mental hospitals. The Department of Mental Diseases in the *Annual Reports* since 1928 inaugurated another important change. It divided all discharges, deaths, and resident population into first admissions and readmissions. Formerly it had been the uniform custom to divide admissions into first admissions and readmissions, but to group the discharges, the deaths, and the resident population. Thus, if anyone wished to

follow through what had happened to first admissions, for example, he would be blocked by the fact that statistics on this classification were not available in the discharges, deaths, or resident population. Massachusetts, in making this important division, enabled anyone to follow through and determine discharge rates, by age, for example, of all *first admissions*. These figures, based upon the present age distribution in the resident population plus the discharges and deaths, give ample opportunity for discriminating analyses of first admis-

sions. Owing to their method of division, similar studies can be made on readmissions.

We see then that mental disease is a proper concern of epidemiology from the point of view of contemporary definitions of this science. The past 20 years or so have witnessed an increasing amount of epidemiological knowledge in this class of diseases and it is my opinion that during the next decade or two mental disease will become an important part of epidemiological science.

Achievements in Mental Hygiene and Promising Leads for Further Endeavor*

C. M. HINCKS, M.D.

*General Director, National Committee for Mental Hygiene,
New York, N. Y.*

IN less than 30 years, the term "Mental Hygiene" has been incorporated in our medical vocabulary and has become associated with a wide range of activities, problems, and possibilities that challenge attention. During this comparatively short time a promising beginning has been made in improving diagnostic and therapeutic arrangements for the mentally afflicted, in strengthening training programs for professional workers, in organizing research, in defining spheres of responsibilities for mental health conservation, in gaining a better understanding of the dimensions and significance of mental hygiene tasks, and in the discovery of profitable lines for further endeavor. It is true that many thoughtful men today are prone to refer to mental hygiene as the most backward branch of medical science, but such an appraisal should not blind us to the fact that there is substantial evidence to indicate genuine progress in this field, and that there are splendid opportunities for productive work that will enrich public health, education, and social service.

It may be worth our while to review

briefly some of the activities that have been contributing to mental health conservation and to give consideration to beginning trends that may lead to significant achievements.

The initial efforts in mental hygiene were directed to the improvement of mental hospitals. Through surveys, public education, and the stimulation of larger expenditures for psychiatric services, an impetus was given to the ushering in of a new deal, as it were, to mental hospital psychiatry. Transformations that were effected in connection with many of our public institutions are illustrated by changes that were brought about in a Canadian mental hospital that I have visited annually since 1918.

Twenty years ago this hospital had 800 patients with only 1 physician in charge. There were no trained nurses. Physical restraint and seclusion were common practices. No attempt was made to furnish occupation for the patients. Deadening idleness abetted deterioration. The rehabilitation rate was low. Today this Canadian hospital is staffed by competent psychiatrists and trained nurses. The reception service for early and recoverable cases is housed in a well designed building and has a complement of 1 physician to 90 patients and 1 nurse to 3 patients.

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

There are well organized divisions for various therapies—occupation, physical, recreational, hydro, and so on. Out-patient clinics and public educational activities have been organized. Research programs have been fostered, and as a result of such progressive steps there has been a gratifying stepping up of the rehabilitation rate.

Such an improvement of therapeutic services in many centers has been appreciated by the general public and has led to the referral of an increasing number of patients for hospitalization. In this connection it is interesting to note that in 1910 there were 159,096 patients in the state mental hospitals of this country. In 1936, the number rose to 398,006, an increase of 150 per cent although the population of the United States, as a whole, increased by only 40 per cent during this time.

Unquestionably mental hospital services have been improved and extended, but if we consider the United States and Canada as a whole, we discover that the advance has not been along an even front—that there is considerable variation in the degree of excellence of institutions in certain areas as compared with others. This is revealed through a recent study conducted by the National Committee for Mental Hygiene that involved a canvass of the 169 state mental hospitals of the country in reference to 18 standards that reflected their clinical and scientific status. The New England and Atlantic states stood at the top of the list, according to the scheme of rating adopted, and the Southern states at the other extreme furnished a considerable contrast. Of the 169 hospitals, only 47 were adequately organized, staffed, and equipped for the most effective clinical and scientific work; and it was discovered that overcrowding was seriously hampering therapeutic activities in many places. Apparently, 78,000 additional beds are required in the United

States, and Canada is also faced with the need for a marked extension of facilities.

It is evident that the mental hospital situation furnishes a continuing challenge in the mental hygiene field. It is of prime importance that our hospital services be elevated to a high plane of efficiency not only because of their strategic importance in the treatment of the mentally ill but also because of the part they can play in fostering community health programs, research, and prevention.

In a review of mental hygiene progress, reference should be made to the organization of out-patient clinical services throughout the country. The first child guidance clinic was established in 1909. Today there are 153 clinics for children each having a psychiatrist, psychologist, and psychiatric social worker on its staff. The total number of clinics for both children and adults stands at 683 for the United States and 53 for Canada. They are meting out a diagnostic and therapeutic service for more than 12,000 new cases annually.

The actual contribution of clinics to rehabilitation and to prevention is difficult to determine, but there is some available evidence to indicate that they are performing a useful function in this regard.

A striking illustration is furnished by experience in the Oxford District in England where the population is stable—the birth rate equalling the death rate, with immigration and emigration cancelling each other. This district is served by one mental hospital and, since the organization of an affiliated clinic during the war, the admission rate to the hospital has gradually declined although the admission rate to the mental hospitals of England and Wales as a whole has been increasing.

The value of clinics cannot be estimated by reference to mental hospital

statistics alone. They have been an important factor in revealing the mental health needs of communities and in stimulating the development of well rounded programs; and those specializing in child guidance have, in many instances, been training centers for physicians, nurses, parents, teachers, and social workers. They have injected a new and needed note in child rearing by emphasizing the importance of taking into account factors of significance to insure healthy mental growth.

No single phase of mental hygiene progress has been of greater moment than advances, during recent years, in strengthening arrangements for the psychiatric training of physicians. Since 1930, more than half of the 68 accredited medical schools of the United States and Canada have subjected their courses to thorough reviewing and have developed better facilities and procedures for pre-clinical and clinical instruction. In these forward looking schools, emphasis is being placed upon the necessity of taking psychological and situational factors into account in all medical practice. Advances have also been effected in connection with post-graduate training in psychiatry. With the development of a number of well organized and ably staffed centers, the United States is gradually assuming a position of leadership once held by European countries. An impetus was furnished for progress in this direction when 2 years ago there was created the American Board of Psychiatry and Neurology that is demanding high qualifications before certification.

There is no question that the attitude of the medical profession generally toward psychiatry is becoming more hospitable. This is particularly true in reference to pediatricians. Many leaders in this field are today prepared to define pediatrics as concerned with child development—mental as well as physical—and they believe that the pediatri-

cian of the future must be equipped to deal with both the physical and mental hygiene problems of children. If progress is made in this direction preventive work will be markedly strengthened.

Other disciplines in addition to medicine are incorporating mental hygiene in training arrangements. This trend is to be found in the fields of nursing, social work, and theology, and is a promising development because the safeguarding of mental health requires the participation of the various allies of medicine.

The question may be asked if the challenges for research in mental hygiene are being met in a statesmanlike way commensurate with their importance. In answer it should be stated that until recently investigatory work has been unduly neglected and that the comparative backwardness of psychological medicine has been due, in large measure, to the paucity of our knowledge concerning the intrinsic nature of mental disorders and their causation; but there are evidences today that research will receive more attention in the future than has been the case in the past. Encouragement is being provided by great foundations, the Scottish Rite Masons, philanthropic citizens, and a few governments who are making funds available for investigatory purposes. There seems to be no dearth of scientists with well defined programs for research who are eager to prosecute studies in this field. In the state mental hospital services alone, there are 100 well qualified men who desire a greater flexibility of working program to enable them to devote more attention to studies in hand. A recent survey of research activities in dementia praecox revealed that \$650,000 per annum could be put to good account in assisting well conceived projects in this field.

That the fruits of research will be seized upon for practical application in treatment and prevention is indicated

by experience in the testing out of the insulin shock treatment for dementia praecox during the last 12 months. In this time 800 patients have been subjected to this form of treatment in New York State alone, with one hospital reporting a return to the community, in improved state of mental health, of 65 per cent of 81 treated cases.

Whether or not insulin shock proves to have abiding value the point should be stressed that psychiatry today is sensitive to scientific advance and recognizes the need for more and more investigatory effort.

In looking to the future there are many beginning trends that are promising and, if firmly established during the next few years, may lead to genuine progress in health conservation. Four avenues for advance commend themselves particularly to the Canadian National Committee for Mental Hygiene and there will be concerted effort in the Dominion, during the next 10 years, to reach specific objectives in each area of work. Since the objectives have pertinence for the United States as well, I will state them and discuss one in particular that relates to public health.

The first objective entails the placement of treatment arrangements for early and recoverable cases of mental disorders, on as thorough-going a basis as pertains today in general hospital practice for those afflicted with physical disabilities. This will involve the development of intensive treatment units in every Canadian mental hospital, to be staffed with a complement of physicians, nurses, occupational workers, and other personnel, and with appropriate building and plant arrangements to facilitate the creation of a wholesome, cheerful atmosphere for constructive therapy and individualized attention. While costs will necessarily be increased, savings will be effected through the rehabilitation of a larger

proportion of patients than has been the case in the past.

The second objective relates to research. There will be the aim of securing governmental action for the appropriation of 2 per cent of mental hospital budgets for investigatory purposes. Such action will contribute to the placement of psychiatric and mental hygiene research on a sound basis and will furnish an impetus to the nourishing of a scientific spirit among hospital staffs that should be reflected in the improvement of clinical work.

The third objective involves the development of a partnership between health workers and educators for the fostering of mental health conservation among school children. It is assumed that, if the circumstances and conditions for child development during the school years are conducive to healthy growth, a reduction can be effected in the incidence of mental disorders—a reduction of the 4 per cent of school children who today seem destined at some time in their lives to enter mental hospitals as patients, and a reduction of the still larger percentage who can be expected to swell the ranks of the psychoneurotics and misfits.

The fourth objective involves the integration of mental health endeavor into the public health activities of the Dominion, with responsibility for the administration of clinics, the community supervision of maladjusted individuals, the conduct of mental hygiene educational programs for certain professional groups and the general public, and the correlation of all mental health work. At present community mental hygiene programs are loosely organized, with inadequate arrangements for the rehabilitation of paroled patients from mental institutions and of others requiring supervision. There is thus a magnificent opportunity for public health endeavor to right this situation and to place community mental hygiene work

on a basis that will compare favorably with the best programs in the field of tuberculosis.

In many ways this fourth objective of assigning to public health departments the responsibility of developing community mental hygiene programs is the most important of all. We appreciate that success in bringing mental disabilities under control will be dependent in large measure upon the degree of effectiveness of community arrangements for prevention and early treatment, and in facing up to such issues the efforts of a few psychiatrists serving large populations is not enough. There is need for concerted action on the part of health, educational, and social work forces. There is the need for the development of long range comprehensive programs wherein the needs and potential resources of the community are taken into account. Epidemiological studies are a necessary first step in the introduction of constructive efforts wherein the sanitation

of the environment from the mental health point of view will be an objective.

Such a broad gauge program necessitates medical leadership under public health auspices, and it is hoped that during the next 10 years leaders in public health will accept the challenge and will pave the way for the active assumption of responsibility. As one prerequisite in this regard there is entailed the mental hygiene training of public health workers. Without such training there can be no constructive participation by public health forces in mental hygiene work. Our efforts today should be focused therefore on this issue.

In conclusion, may I say that the future for mental hygiene is bright if leaders in public health, education, social welfare, and the supporting sciences will view mental hygiene problems, not as the sole concern of a limited group of specialists, but as a vital challenge in their own field.

Patients, Not Diseases, Are Treated

SIR Auckland Geddes, in an address delivered at the Bicentenary of the Royal Medical Society (reported in the *Edinburgh Medical Journal*, 44:366, 1937, and quoted in *Economics of Radiology*), said:

Time and again, when, in various parts of the world, I have found myself ill or injured and confined to bed, I have been attended by doctors who never even found out that I had any medical training; in fact, they never found out anything about me at all. They were concerned to treat "The Injury" or "The Disease" and not me, the patient;

they were, in short, dealing with a pure abstraction and thinking that they were being very scientific. The more I have seen of life and death, of pain and suffering, the more clearly I have realized that there is never in the real world outside the walls of the Medical School and teaching hospital "A Disease" to be treated; there is never "An Injury" to be dealt with; there is just a sick child, woman, man, to be helped to get well. In short, the real business of clinical medicine is not science. It is, in the case of each sufferer, a personal relationship into which sincerity and medical knowledge are suffused by the physician, and trust and some dependence by the patient.

Relationship of Maternal and Child Health to the General Health Program*

THOMAS PARRAN, M.D., F.A.P.H.A.

Surgeon General, U. S. Public Health Service, Washington, D. C.

THERE is an interdependence between measures directed toward improving maternity and child health and those directed toward improving the general health. There is a similar interdependence between all public health measures and measures designed to promote social welfare and security.

While this Conference is concerned primarily with the health of mothers and children, let us bear in mind that all health problems are family problems, and that family health is one phase of family security. In the mass, family security means social security. Better maternity and child health is or should be among the underlying purposes of any social security measures.

Our specific measures to protect the health of mothers and children count for little if the family income is insufficient to supply nourishing food and decent housing, if the mother's health is undermined by unhealthful sweatshop conditions, or by long hours. Efforts to improve child health count for little if the child must labor in a factory with no opportunity for normal recreation and development. Similarly community protection against impure milk and water, against the acute communicable diseases, against tuberculosis and syphilis and other preventable

diseases which shatter the family well-being, has a direct bearing upon child health on the one hand and upon the security of the family on the other.

For a long time this relationship between poverty and disease has been known. More recently through the National Health Inventory we are able to measure this relationship in exact terms. From these records, it is clear that the one-third of our population ill fed, ill housed, ill clothed also is ill provided with the opportunity for health and life. Illness among persons on relief is 57 per cent higher than among those in comfortable circumstances. The case rate of chronic illness among those on relief is 87 per cent higher than among those with comfortable incomes. In relief families, 1 in every 20 family heads is unable to work because of illness, while among those in comfortable circumstances only 1 in 250 is similarly disabled.

Six million people in the United States are unable to work, attend school, or pursue their usual activities on an average day during the winter months on account of illness, injury, or because of gross physical impairment resulting from disease or accident. Two and one-half million of these are disabled because of chronic disease and permanent impairments. The amount of medical service varies inversely with income. Physicians' services per case of illness were approximately 50 per

* Address before the Children's Bureau Conference on Better Care for Mothers and Babies. Washington, D. C. January 17, 1935.

cent less for relief families than for the higher income group.

By doing what we know how to do to improve the health of this underprivileged group we have the best opportunity of breaking the vicious circle of poverty, ignorance, and disease. Poverty increases disease, which in turn engenders fresh poverty. Until the economists have given us knowledge wherewith to produce and distribute a national income sufficient to provide for the minimum needs of every family, we can at least provide a more equal opportunity for health.

Only a feeble start has been made toward that goal, but I would discuss with you the steps which seem urgent for us as a nation to take in that direction.

A start was made in the evolution of a national health program when the Social Security Act went into effect 2 years ago. Through grants-in-aid to states for maternity and child health, for the care of crippled children, and for general public health work, a real stimulus was given to improved health conditions throughout the country. For the first time it has been possible to appraise the health needs of the several states and communities. The amount of federal aid now invested in national health represents approximately 10 per cent of the total cost. The actual amount of money, less than 13 million dollars, is small in comparison with what government is spending for the end results of health neglect, for the results of untreated disease which load our pension rolls. For example, pensions and care for the syphilitic blind cost 10 million dollars a year. Institutional care of those made insane by syphilis costs another \$31,400,000.

The time seems opportune to expand the federal government's participation in a broad national health program to include: more effective measures for the protection of the health of mothers and

children; the organization throughout the nation of comprehensive measures to cope with those large causes of disease and death for which science has given us weapons of unquestioned power, the provision of the additional hospitals, sanatoria, health centers, and other physical facilities which are necessary and now are lacking in many areas; and better medical services for the medically indigent and the dependent groups of the population.

Such a health program for the prevention of disease and for the better care of those individuals unable to provide it for themselves will bring measurable reduction in future costs of dependency and disability. Without such measures children will need support because their mothers die needlessly in childbirth. Unnecessary deaths from tuberculosis will create additional dependent families. Poorly treated syphilitics will continue to fill our insane asylums and load our relief rolls.

The 12,544 mothers who died as a result of conditions of pregnancy and childbirth in 1935 do not represent the whole of the loss from childbearing. In the past it seems clear that we have underestimated the size and scope of the problem, for there were more than 60,000 babies who died within 2 weeks after birth; there were 77,119 recorded stillbirths. In other words, there occur in the country each year more than 150,000 deaths, 60 per cent of which are due to our mismanagement of the childbearing function.

Economically, children are more valuable now than ever before. The birth rate per 1,000 population continues to decline from 25.1 in 1915 to an estimated 16.5 in 1937. This decline of one-third in the birth rate means that 1,079,000 fewer living babies were born last year than would have been born if the rate had remained at the 1915 level.

We have an ageing population. We have a population which, if present and

past trends continue, will become static within three or four decades. Inevitably our gross death rate will increase. This is to be expected and is not so much a cause of concern as the continued and unnecessarily high death rates in early life and from preventable causes.

The best estimates are to the effect that one-half of the 125,000 babies who died last year were lost unnecessarily. At least one-half of the 12,000 mothers who died in childbirth could have been saved.

An analysis of these maternal and infant deaths shows very uneven rates. In Denver, for instance, a study has shown a death rate among babies in families of less than \$500 annual income to be 168 per 1,000 live births as compared with 30 in families with incomes of more than \$3,000. Deaths from childbirth among Negro women were nearly twice as high as among the white. (There are 9.6 deaths of Negro mothers per 1,000 live births compared with the white rate of 5.4.) Negro babies die at the rate of 88 per 1,000 live births compared with the white rate of 53. Nor has the Negro shared in the health advances of recent years. Since 1920 Negro males between 20 and 50 years of age have suffered a loss in life expectancy of 10 per cent. Among every group which is economically under-privileged, preventable deaths exceeded those among the economically privileged.

For example, in the State of Michigan, no prenatal care is received in 4 of every 10 pregnancies among families on relief, while those in comfortable circumstances get such care in 9 of every 10 pregnancies. Of those on relief, only 26 per cent get adequate prenatal care, while of those in comfortable circumstances, two-thirds get adequate care. Yet medical care in Michigan is above the nation's average.

Approximately 1,000,000 children are

born each year in families on relief or with an annual income of less than \$1,000. Here are found the highest death rates of mothers and of infants; here the least, and the least good medical care. Tax funds should provide the medical, nursing, and hospital costs of childbearing for every woman unable to provide good care for herself. The greatest freedom of choice of the physician should be allowed which is compatible with securing competent service. Such aid would remove an immediate and grave economic barrier to bringing a child into the world.

It would substitute good care under strict professional standards for the haphazard and criminally poor care now being received by so many women. Because they may not have paid the doctor's bill for a preceding childbirth or illness, there frequently is great reluctance on the part of under-privileged women to report to a physician for care early in pregnancy, especially in the rural districts and in those cities where prenatal clinics and free hospital services are not available. Moreover, unless they are entirely destitute and desperate they shrink from going to the welfare officer for aid, because of the stigma surrounding an application for public relief. I propose that public aid for the medical, hospital, and nursing costs of childbearing be put upon the basis of the medical need rather than be measured by the yardstick of a pauper's oath.

Health supervision during infancy and childhood is needed for this same group of the population. In the schools the training of children should include much more attention than we now give to proper nutrition, to full physical development, to the correction of defects, and to training in correct health habits and attitudes.

That tuberculosis is a battle half won should spur us to win the remaining half. The broad averages of 56 deaths

per 100,000 population hide rates among unskilled workers 7 times as high as among the professional groups, and among the colored in the young adult age groups nearly 10 times the white rate. Isolation of active cases in sanatoria has been the keystone of the tuberculosis control movement. Yet in 26 states, there is less than 1 bed per annual death. To provide for the whole country the accepted standard of 2 beds per annual death would require an additional 50,000 beds for the care of the tuberculous. To do the case finding, perform skin tests, make X-rays on positive reactors and on home contacts, and utilize collapse therapy more widely, will require the mobilization of tuberculosis control forces on an unprecedented scale in whole states and sections of the country where now death rates are high and little or no action is being directed against them. In these same areas one finds the most meager financial resources. Substantial federal participation in this campaign is the opportunity of any administration sincerely concerned in helping the under-privileged. By a concerted national effort against tuberculosis there is reason to believe that this disease within a generation can be reduced to the present negligible proportions of typhoid fever.

Syphilis is another disease as serious as tuberculosis and even more devastating in its economic and social effects. Against it we have cheaper methods of case finding, surer methods of arrest and cure, and a method of chemical quarantine which will promptly prevent spread. Yet the battle against syphilis has just started. You who are concerned primarily with the health of mothers and children have neglected for long years this most easily preventable cause of stillbirths, of sickly, deformed infants, of broken homes. The 60,000 babies with congenital syphilis born in this country each year can be

the first major health hazard of the next generation to be removed. To do this we need only to transfer some of the effort and cost now spent in the care of late results of syphilis to the finding of early cases, sources of infection, and contacts, and to providing them with adequate treatment. That this must be largely a public obligation is shown in recent data collected by the Public Health Service. About one-half of syphilis cases now are treated in clinics, the other half in doctors' offices. Of those whom the doctors treat 28 per cent have an annual income of less than \$1,500—insufficient, all will grant, to pay for subsistence for a family plus a complete cure. Opportunity for cure within the means of the patient is a first necessity. Syphilis control is a national problem. A national conference of experts last year recommended a federal expenditure of \$25,000,000—half a battleship a year—which in my opinion would give this country greater security than the same amount spent for armaments. Let us add to this a law in every state requiring freedom from infectious syphilis as a precedent to the issuance of a marriage license. It is devoutly to be hoped also that you obstetricians can improve obstetrical practice in this country to make a blood test early in every pregnancy as routine as is the putting of antiseptic drops into the eyes of every new-born baby.

Only recently and in a few states has pneumonia been accepted as a public health problem. Taking a toll of 100,000 lives each year this disease ranks next to heart disease and cancer as a cause of death. Many of these deaths represent terminal conditions among the aged. How many are due to the pneumococcus we do not know. We do know that a large proportion of the pneumococcic pneumonias are caused by those types of organisms for which we

have an effective curative serum. We do know that the death rate from pneumonia is $3\frac{1}{2}$ times as high among unskilled laborers as among professional groups. We do know that of the deaths under 1 year of age, 20 per cent—1 in 5—are due to respiratory infections, chiefly the pneumonias. We do know that the prompt typing and the use of serum for appropriate cases will cut mortality in half. Yet in nearly every state the basic laboratory facilities to type the disease are not generally available. In all but 2 states, curative sera are not to be had by any except the minority of patients able to pay from \$50 to \$150 for this life-giving remedy. Of every 2 cases treated with serum 1 life can be saved. Is it worth the cost? Here again public provision of these essentials of life are needed on a national scale if we are to reduce the toll of pneumonia deaths.

In the control of cancer we have less exact, less effective tools. Yet before a committee of Congress last year, experts testified that if all cases of cancer received the type of good treatment now available in a few cancer institutes, we could reduce the present toll by at least 20,000 annually. To do this will require a national effort. It will be necessary to establish treatment centers, train expert staffs, provide radiation therapy, and make the services of these centers available to those sufferers unable to pay for the expensive care required.

Persistent, coördinated, systematic research is essential to future cancer control. Congress has recognized this by establishing a National Cancer Institute under my direction with an annual authorized budget of \$700,000 to accomplish this purpose, and to bring the best available knowledge to the help of the present cancer victim. Ways and means of accomplishing these purposes are being worked out with the help of the best minds in the country.

For many other diseases such as malaria and pellagra, we have known but unused methods of prevention.

For others such as acute rheumatic fever, influenza, or cancer, persistent and systematic research is the first need, in order to develop effective methods of control.

In this discussion of our major national health problems and the ways of dealing with them you will recognize an underlying theme: Good treatment, early treatment, means prevention of other cases, and means prevention of death or serious disability for the patient. In fact, one can make the general statement that prompt restoration of an individual to health is an essential part of any complete regime of prevention. Whenever any disease is so widespread in the population, so serious in its effects, so costly in its treatment that the individual unaided cannot deal with it himself, it becomes a public health problem.

Better care during pregnancy and childbirth, protection of the health of children, good nutrition and sound physical development in youth, protection against the acute communicable diseases, control of tuberculosis, syphilis, pneumonia, cancer and other catastrophic diseases, all assume an importance to the community as a whole. The taxpayer now has a financial stake in good health for all. He pays for its neglect in pensions, in relief, and in institutions for the care of the end results of unprevented disease and untreated illness, and in the economic wastes of early, needless death.

I have discussed the measures needed against specific diseases and conditions of national importance. To put these measures into effect we need a reorientation of our public health machinery. We need to build upon the skeletal forces we now have, health organizations in every community able to cope with these new and larger health problems.

We need to coördinate, to integrate the facilities now available—the hospitals, the practising physicians, dentists, nurses, social welfare agencies, in fact, all of the professions and agencies directly concerned with good health. This can be done without any basic change in our present system of medical practice. In fact, much of the public effort will be directed toward making available better tools for the use of the practising physician as a step toward providing necessary facilities for health.

Many areas at present, however, are lacking in the basic facilities requisite to good health. I have referred to our deficiency of tuberculosis hospital beds. May I call attention also to the 18,500,000 of our population living in 1,300 counties with no general (registered) hospital facilities whatever? We do not need a general hospital in every county, but even the minimum standard of 2 beds per 1,000 persons indicates a need for an additional 22,000 beds in rural areas.

Care of the mentally sick is still on a primitive basis in many states. Domiciliary care, little medical attention, no use being made of newer methods of treating general paresis and dementia praecox, is the rule. We need additional beds for mental patients but more than that we need to provide a mental hygiene program to replace the present insane asylum attitude in the care of the mentally sick. Such a change would in future years measurably reduce the load which now burdens all of us.

Many communities lack the laboratory aids to medical practice which modern science indicates are necessary if we are to apply present medical knowledge effectively for all the people. Public funds are needed to provide laboratory services not now available.

Local health departments typically are housed in the basements of city halls or county courthouses. The newer concept of public health can be more

easily put into practice through physical facilities such as health center buildings. Frequently these can be combined with small community hospitals. Many new post offices have been built. With federal aid thousands of new schools have been built. Let us now provide needed hospitals, sanatoria, mental hospitals, and health centers.

Having provided services for those diseases and conditions which are of particular public health importance, and the physical facilities needed for efficient health work, there still remains the lack of general medical care for dependent groups of the population and for those in the marginal economic groups. The evidence is clear that they now get inadequate care. Yet since the time of Queen Elizabeth the idea has been written into the laws that medical care of the indigent is a responsibility of society equal to the responsibility of providing them with food, shelter, and clothing. This idea still lacks application.

We have seen that those on relief have a 50 per cent excess of acute illness and nearly twice the amount of chronic illness experienced by those in the comfortable economic group. Others in the marginal economic groups have the next highest rate and many of them will later be burdens to society because of preventable disease or remedial defects. Many of these illnesses are not curable with present medical knowledge, yet even for them medical care is a humane measure of relief. For a large proportion, medical care will restore health and employability. The returns in reduced relief loads should be enough to pay the cost of the whole job of giving medical care to the dependent groups of the population. Again, a fundamental program seems needed to do this job (with the cost shared by federal, state, and local budgets) which will provide general medical care for the dependent groups of the population.

Our existing structure of social security provides old-age pensions to the needy, unemployment insurance and old-age annuities to soften the impact of job loss and old-age destitution; aid to dependent children and the blind; and the beginnings of a preventive program in public health, maternity and child health, and aid to crippled children. To this base I propose we add a real, nation-wide, result-getting health program which would provide: (1) for all citizens those community measures of sanitation and disease prevention which are necessary if any of us are to be safe; (2) for the underprivileged third of our population, such specific measures of prevention and treatment as good maternity care, child health protection, the control of tuberculosis, syphilis, pneumonia, cancer—conditions which are too important to the nation as a whole for us to permit continued neglect; (3) for areas without them, the physical facilities for good health such as hospitals, sanatoria, and health centers without which no national health program can operate effectively; (4) for those on relief and dependent upon public funds for the other necessities of life, a minimum standard of general medical, dental, nursing, and hospital care.

In my opinion, the major cost of this program should be borne by local and state funds with federal assistance. The health program should be under local operation, adapted to the needs of the community, with state supervision and federal guidance and aid particularly to insure minimum standards and to equalize the financial burden. A pro-

gram such as this costs money, large sums as compared with present expenditures for health, but small as compared with the cost of continued neglect. It will be a wise investment of public funds. It will pay dividends in a more fit citizenship, a less dependent citizenship.

Up to now we have been so busy bailing out the boat that we have neglected to calk up the seams. Let us put first things first in national planning for a more prosperous nation, a more healthful nation, a sounder national economic structure.

A national program of health is essential to any national plan of rehabilitation. It will pay dividends in dollars no less than in human lives. Savings to the nation's economy will be apparent immediately. Savings over the next decade will easily amortise every dollar spent.

May this Conference draw the blueprint for a comprehensive program upon which we can build a sound structure of maternity and child health; and integrate it with the whole composite of a national health program, which is essential for health security, for economic security, for the security of our democratic institutions.

As doctors we have been too closely concerned with gross pathology, too little concerned with positive health—which means much more than freedom from obvious disease. Other nations are making strenuous efforts to produce a generation fit for war. Surely we need no less a generation physically fit for the pursuits of peace.

Essentials of an Effective State Plan and Program of Activities for Flood Sanitation*

C. W. KLASSEN AND
ARTHUR P. MILLER, C.E., F.A.P.H.A.

*Chief Sanitary Engineer, State Department of Health,
Springfield, Ill.; and Sanitary Engineer, U. S. Public
Health Service, New York, N. Y.*

THE location of Illinois in the Ohio River basin places her in a more fortunate position than that of some of her neighbors when it becomes necessary to prepare for flood waters with their resultant destruction, in that a longer period of time must elapse before the river's crest reaches Illinois borders. On the other hand, being at the river's mouth, this state bears the full fury of its flow after being swelled by water from the tributaries which enter it before it joins the Mississippi River at Cairo. In the 1937 flood, forewarnings were available and were heeded, but the unprecedented flows counterbalanced in a measure the good which, under normal flood flows, might have been expected to result from forecasts. However, the ability to anticipate and prepare for a catastrophe such as this is of the greatest importance, even if the time gained for so doing is less than that desired.

Experience is a good teacher but learning lessons at the expense of the public health is too costly. Therefore,

it behooves us to profit by the experiences of others and to avail ourselves of the facts learned in a task of the magnitude facing those in Illinois following this flood. The successes and failures resulting from the execution of the program in this state teach valuable lessons and this paper is prepared for the benefit of those who may find themselves in a parallel situation at some future time. It does not recount incidents, suggest procedures or outline a plan based on hypothetical conditions, but rather on a variety of real occurrences which cover all phases of flood sanitation work.

EXTENT OF FLOOD

The entire gamut of flood problems fell on Illinois early in 1937. There were sudden breaks in levees inundating, within a few hours, municipal areas and large stretches of farm lands, and also there were slow rising waters which gave ample time for the preparation and effecting of some remedial measures. Municipalities many miles away from the Ohio River were flooded by encroaching backwaters. Some towns were completely covered, others

* Read at a Joint Session of the Conference of State Sanitary Engineers and the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.



High Water at Harrisburg

partly so, and one, in its outskirts, leaving a high center as an island. Other states had larger cities with greater populations under the same flood but they had more and better facilities of all kinds with which to meet their emergencies. In Illinois, the many small communities lacking adequate municipal organization, equipment, financial resources, and communication and transportation facilities, presented relatively more difficult problems.

Health and sanitation work could not be concentrated in a small area but had to be spread over a considerable territory. The southern part of Illinois is comparatively flat and low-lying and consequently the river at its crest was able to reach 10 counties and cover 978 square miles. Such an extensive area included many communities and settlements. Unfortunately for flood sanitation operations, this section is lacking in railroad connections and paved highway mileage. As compared to area, the population stricken was small, being only 35,100, but as it is a population of home

owners and renters, many people suffered. Although this section is one in which the incidence of communicable diseases is normally higher than that of the entire state, it is also the general section in which during the last 3 years special emphasis had been given to typhoid fever and diphtheria immunization work.

PERSONNEL

Tornadoes and floods in Illinois in other years provided a certain amount of catastrophe work and experience for the older members of the engineering staff of the State Department of Public Health, but on the whole much of this work had to be done with inexperienced personnel. There were available on the department's staff or on projects with which the department was closely affiliated a group of 29 technical men. This number included 10 who had only recently been placed on duty under the provisions of the Social Security Act; 5 were from the malaria control project then being operated in this southern section of the state; and 3 from the community sanitation project. Un-

fortunately, the district health units formed as a result of the Social Security Act had not reached maximum efficiency and this limited their usefulness, but this emergency confirmed the value of decentralized health work and the suitability of units such as are being organized here to intensify public health work in political subdivisions smaller than a state. The engineers from the malaria control and community sanitation projects were of great help because of their familiarity with this part of the state and their knowledge of the persons who could be of most use in work of this kind. Other departments of the state furnished 6 men and, through the U.S. Public Health Service, 6 men were secured from other states and cities. The Service also had 5 men on field work here for more than a month.

MOBILIZING EQUIPMENT

Early in this strenuous period and before the extent of the flood could be predicted, the department started to mobilize its equipment. For many years it has had emergency chlorination outfits and, because of the close relations existing between the department and plant operators, other types of equipment were made available. The department's mobile laboratory was despatched to the flooded section and later performed good service with an important saving of time on the water supply work. Consideration was also given to publicity and to the preparation of large numbers of various types of instruction sheets and handbills for distribution among the people.

PHASES OF FLOOD SANITATION WORK

Flood work readily falls into two rather distinct phases: that during the period the water is rising to its crest, and that during the recession of those waters and after they have again withdrawn to their usual courses. With the

rising waters, hysteria is inclined to prevail, often influencing the quick decisions frequently needed. Then men are needed who can decide quickly and correctly on the spot what must be done; men who can "keep their feet on the ground" and not give way before all of the suggestions that are made. In the second phase, most of the hysteria has passed but, what is worse, apathy then sets in. While the waters are rising, everyone willingly sacrifices himself to do or give something, but when the mud begins to show there is a tendency for the "heroes of a day" to disappear leaving the slogging work to those more intimately concerned with the public welfare. In those conditions, men are needed who have a driving force behind them and a desire to see a hard job well done, and an endless amount of tact. These qualities should not be ignored in any organization work for they are quite as essential to the success of a scheme as technical ability.

PRE-FLOOD ACTIVITIES

Prior to the time when the Ohio River reached its crest, much effort was devoted to keeping threatened water supply systems in operation, preparing them for inundation and providing temporary facilities which would play a part after the water reached its peak and these plants had been forcibly closed. Eventually 9 public water supplies were affected; 7 being entirely out of service, 1 continuing operation behind 14' of diked-out water, and 1 other operating under the protection of a levee system, but in the early stages this could not be foreseen. The first department engineers were sent to southern Illinois before any municipality was dangerously threatened. To each public water supply where trouble was anticipated, a sanitary engineer was assigned, and emergency sterilization equipment was

installed. All available private wells and cisterns on high ground in areas contiguous to that about to be flooded were treated with chlorinated lime and, after the quality of the water in them had been assured, were placarded with signs reading "Safe Water—This Water is Being Treated and Kept Safe by the Illinois Department of Public Health." In some instances, barrels and tanks of water were maintained. The ready availability of water of good quality in the high areas was found to be an important factor in controlling water-borne illness when the public water supplies were placed out of service or when refugees had to be moved into those areas.

By contact with relief organizations, the field engineers were often able to learn in advance to what point a community was to be evacuated and then to have ready at that point suitable drinking water and other sanitary facilities. If the area to which refugees were to be evacuated was outside of the reporting engineer's territory, the information was relayed to the proper person through the Carbondale field office. This particular activity could have been materially improved, and much valuable time saved if better prearrangements had been made with the Department of Public Health by the agencies removing refugees. This is an extremely important factor in work of this type if the health of the stricken people is to be guarded. During the latter stages of the emergency, better coördination of this work was secured and it proved the value of all efforts to link together refugee movements and the preparation of sanitary work. During this phase, 490 wells, cisterns, barrels, and tanks of drinking water were supervised and maintained in a cleanly condition by the department's engineers.

In some municipalities, in order to locate wells and cisterns which might

be useful when needed, Boy Scouts were employed to canvass areas and locate them. The information they collected was spotted on local maps and utilized at the proper time. It was found that in the chlorination of these small supplies care had to be exercised to eliminate objectionable, chlorinous tastes. If that had not been done, the object of the work would have been defeated because the people would have resorted to other sources of drinking water. A single chlorination of a supply was not found to be sufficient, and constant checking was needed. Wells which were seriously polluted and unsafe for drinking were posted with a sign reading—"Warning: Polluted Water—Do Not Drink."

By anticipating the flooding of a municipal water plant, it was possible to save much equipment. Pump motors were hoisted to high places and other apparatus was made secure. These actions resulted in water works being placed back into operation, after the flood water had gone down, several days earlier than it could have been done otherwise. Another advantage accruing from the assignment of men to areas about to be flooded came through the use of public notices to close off all water lines before leaving property and to give such other assistance as might be helpful after the waters had retired. Even with such warnings, it was found, in many cases, that faucets and taps had been left open and that consequently it was difficult to build up pressures in distribution systems. In one partially inundated municipality with a public water supply, it was necessary to valve off the distribution system in the flooded section.

One unforeseen development in flooded sections of cities was the washing away of small homes and the consequent breaking of their water connections. This reduced pressures and quantities especially when it was im-

possible to cut out the disturbing lines. This was counteracted sometimes by guying these houses to nearby trees or by placing sand bags on the roofs to prevent movement. Where a public water supply had an elevated tank on the system, it was filled to capacity before the town was evacuated and the valve at the base of the tank closed. This stored water then was of great value in rehabilitating the distribution system. Adequate plans of local water lines proved their value in these situations.

In connection with meeting water demands, another problem arose which had not been foreseen. The transfer of refugees into small municipalities placed excessive burdens on both the water and sewage disposal systems there. The population of some of the smaller receiving towns was increased many times above the normal over night, and it was found that the sanitary facilities were not of such capacity as to accommodate this sudden growth. In some cases, refugees had to be moved from one location to another to relieve

these burdens. It is believed that such conditions could have been avoided through more thoughtful planning and closer coördination of the relief agencies with the State Department of Public Health.

One city presented a special problem because a high portion in the center was not flooded but the environs were completely covered, creating a central and inhabited island. From previous experience, it was known that to control water-borne diseases adequately, safe drinking water must be brought to the very door of the consumer. Hence, that was done in this city by securing tank trucks of water at the nearest safe public supply, transferring it to milk cans, at which time it was chlorinated, and then barging it to the unflooded sections of the city and distributing it by truck. Each truck had a definite route much like a milk route, and the citizens were informed through the local radio station that upon arrival of the water truck they would be permitted to secure an adequate quantity (1 gallon per capita per day) for



Barging Safe Drinking Water Into Harrisburg

the federal agencies at work with those of the State Department of Public Health, (2) making available to state personnel the results of experiences with other disasters of like nature, and (3) supplying field personnel of the categories desired to augment that of the state. Without some one tying together the plans of the many different groups then in the flood area, success could not have been attained so smoothly. In Chicago, the Service's District Engineer maintained telephonic contact with the field at all times. By remaining there, the health workers in the field had a representative on the job when it was necessary to secure decisions from the Works Progress Administration, the U. S. Army, or some other federal branch whose field representatives could not make them. Speed in this type of work is important and any undue delays ungear the entire operation. He was able to speed up the transmission of supplies and to secure tank cars of safe water which were spotted at the neediest places for subsequent use. In the field, the Service had another engineer (A.P.M.) whose time was devoted to working with the state and to harmonizing the activities of all other federal agencies on this job with those of the state.

As to personnel, the Service was able to supply, through its District Engineer in Chicago, all of the additional help as it was needed. This was made possible by the early creation of a reservoir of persons whose services were promised if a need for them arose. This plan had great flexibility, for it was unnecessary to request help until it was really needed when it was known that sufficient technical assistance was in the background and would be despatched quickly upon call.

ESSENTIALS TO SUCCESSFUL PROGRAM

Four essentials in the conduct of emergency work of this character

might be stated as (1) a centralized headquarters within or adjacent to the stricken area in which the director of the work or his executive shall be ready to respond to inquiries at all times, (2) a decentralized working field force with sufficient supplies and transportation, (3) complete harmony among all agencies working to the same end, and (4) frequent and constant liaison between the working field force, the coordinate agencies, and the director's office. In Illinois, all of these essentials were present and maintained throughout the work with a high degree of efficiency.

At Carbondale, the malaria control project office was ready and waiting when this emergency arose. It was happily located with respect to the territory subject to flooding and to the central offices of other groups; well equipped as to office appurtenances and telephones; and conveniently located as to highways and other transportation facilities. Its equipment was supplemented by a telephone service to the nearest headquarters of the state highway patrol and a short-wave radio sending station, and a short-wave receiving set. As a concentration and distribution point for both personnel and supplies, it was a satisfactory location. Its connection with the highway patrol was very helpful because that group performed yeoman service night and day during the earlier phase. The radio sending and receiving connections were of inestimable value because during the period of extreme high water the only method of communication from some points was via the air. At this office, the authors maintained their headquarters for more than a month. In addition, an executive engineer from the state staff was present all of the time with all necessary stenographic and clerical aides. This office was open 24 hours each day. Here a large wall map built up from U. S. Geological

Survey quadrangle sheets was maintained to show high water levels. This was very helpful in planning field work and predetermining breaks in highway communication. To this office, all incoming personnel was sent to receive instructions and directions before advancing into the flooded zone. All medical activities centered in this office also.

A decentralized field force was secured by establishing 9 temporary districts to cover all of the flooded area (Chart 2). Each had a sanitary engineer in charge and all were responsible to the chief engineer. Eight of these districts were coextensive with 8 counties while the 9th embraced parts of 2 counties. Inasmuch as these temporary district engineers had to secure their labor force through the WPA's local engineer, the headquarters of the sanitary districts were established at the same points as those of the WPA county engineers. This method was very beneficial in that it permitted these two engineers in each county to

work in close harmony. In some cases, the sanitary engineer made his headquarters in the same office as the WPA engineer. In addition to the engineers in charge of the districts, there were others assigned to work under their direction. The number of engineers was varied in each district in accordance with the needs, and as work decreased in volume in an area, surplus assistants were shifted to another district. In general, in each district there were sufficient engineers so that the work could be sub-divided into the 4 special activities shown on Chart 1.

All sub-supervision, labor, materials and most supplies were furnished by the WPA. The CCC established local bases for truck trains throughout the area (see Chart 2) in suitable parks and within truck-travel distance of operations. With these they undertook to furnish transportation until other facilities became available. When trucks were not in use for military purposes, the Illinois National Guard (see

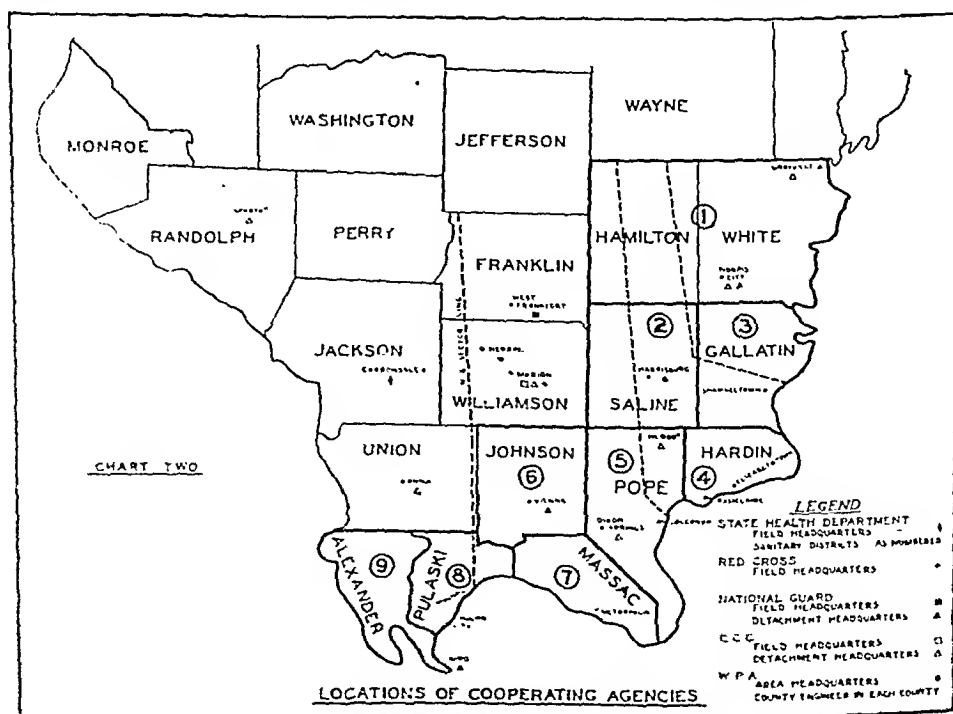


Chart 2) also helped perform the many tasks requiring hauling.

Coördination between all of the agencies engaged in the same task was secured by preparing a plan of work (Chart 1), explaining it to each agency and then through daily visits to them. Each agency was kept informed by a daily memorandum of any new policy and of the status of work.

Liaison was maintained between the field staff, all other agencies, and the directing engineer's office by meetings, telephone, telegrams, and radio. During the first phase of the work—before the flood had reached its crest—every key man in the field would telephone or radio to the field headquarters at a prearranged time and report conditions in his area, receiving at the same time any necessary instructions for the next day. This scheme eliminated any "free lancing" by personnel; kept the program of work under one person's direction; assured complete coverage of affected areas; avoided duplication; and permitted a flexible distribution of men and supplies to meet the needs. This conference generally took place late at night, and before morning the information received from all those reporting had been put into a complete statement and sent to the main office of the State Department of Public Health, the District and Washington offices of the U. S. Public Health Service, and all other agencies in the field such as the Red Cross, WPA, National Guard, Coast Guard, CCC, and U. S. Army. These reports not only gave a résumé of accomplishments to date, but indicated refugee movements and pointed out other matters of use to the coöperating agencies in their fields of activity. Incidentally they made a connected history of activities during the entire period under discussion.

Besides nightly reports, weekly meetings (at night) were held in the field

headquarters. To these came the temporary district engineers and representatives from all other groups. The difficulties of operation such as securing labor, supplies, and equipment, were discussed and settled here. Some controversies were fiery, but to the credit of those involved, all questions were eventually settled to the benefit of the work at hand. This clearing-house of troubles was extremely beneficial. It is difficult to see how such a group of agencies could have worked together without some such common meeting ground.

DETAILED PROGRAM FOR FIELD WORK

A plan for a task of this scope and magnitude must be subject to change to fit unforeseen conditions. Chart 1 shows the organization of the work as it really functioned, including all changes made during its progress. There were four objectives, namely, (1) rehabilitation of public and private water supplies, (2) rehabilitation of sewer systems, and the provision of methods of wastes disposal at homes, (3) cleansing and reconditioning of public buildings, schools, dairies, and milk pasteurization plants to such an extent as to place them in the same condition as they were prior to the flood, and (4) disposal of carcasses and other decaying matter. Cleaning of private homes was held to be the responsibility of the owner, but advice was freely given through various media.

Facing this task it looked appalling in extent. Much pioneer work had to be done and many lessons were learned through successes and failures. One point definitely established was that clean-up work must commence promptly upon the recession of the waters and then follow closely behind them. Publicity was given to the proposed program through the press and the radio. Several times during the work, special phases of the activities were publicized

through the assistance of various co-operating groups; handbills and bulletins of instructions were distributed in isolated areas and were tacked on the outsides of homes or other buildings where they could be readily seen by returning owners; and any other useful means of conveying warnings was used when possible. These instructions emphasized the need for boiling drinking water. In all flooded towns, handbills were tacked at the entrance of the homes, on telephone poles, and at other conspicuous places, warning the citizens that drinking water should be boiled until public approval of the local supply had been given. Brief bulletins explaining the need for care in securing water, about the proper disposal of human wastes, and regarding the use of flooded foodstuffs had been prepared in advance and were used generously.

PLANS MATERIALIZE

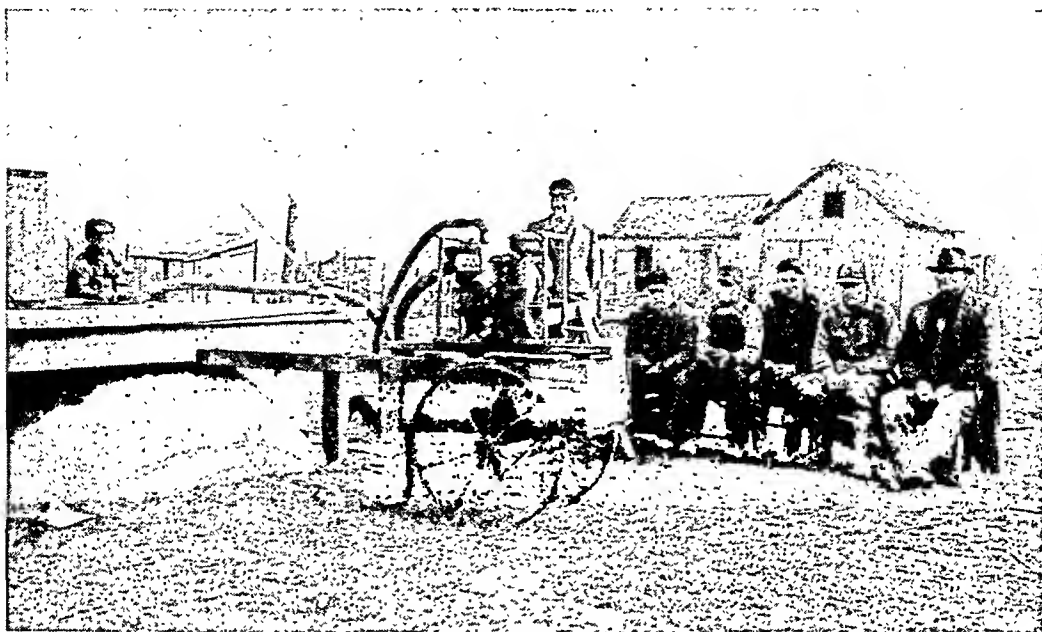
Each district functioned much like each other one. Every morning the various crews of WPA men met with their foremen at designated points to receive instructions from the sub-engineer in charge of each activity. CCC trucks were available to move workmen and supplies to that day's destination. Generally, the first task after the water receded was the collection and disposal of carcasses. The smaller ones were usually buried where they were found or close by, but larger ones had to be dragged or hauled to lots where crews of men had been set to work digging trenches. It was important to bury carcasses just as soon as they were freed from the water. Little success was had in burning them, but rendering works collected some. Five hundred large animals—cattle, horses, and mules—and 5,100 small animals—chickens, dogs, cats, and pigs—were handled.

Each temporary district engineer had

received instructions concerning the disposal of bodies of human beings. However, not one was found nor were there any drownings recorded in Illinois as a direct result of high water, though several persons lost their lives while being transported to and from their work in boats.

The rehabilitation of water supplies in the unwatered areas was carried along at the same time as the disposal of the carcasses. Crews of men with foremen were trained for this work. It was found to be impractical to start pumping flood waters from open wells too soon because of the high level of the adjacent ground-water. This was learned, however, only after the walls of several dug wells had collapsed when the water within them had been withdrawn. Just as soon as soil conditions permitted, this work went forward by the use of portable gasoline pumps mounted on trucks for large wells and cisterns, and hand pumps or buckets and ropes for small ones. The aim was to replace a well in a condition comparable with that which existed before the flood, but it was found that the thorough cleansing given to them exceeded that objective. Very few drilled or driven wells were encountered in this area.

In working on dug wells, due regard was given to the physical hazard of entering them and written permission was secured from an owner before any pumping was started if there seemed to be any possibility of the collapse of a nearby structure. Each finished water supply was tagged, giving the date of the work and name of the supervisor handling it, not for the purpose of conveying information on the purity of the water but to avoid duplication. Along with this program, it was possible to carry on some good educational work because frequently owners observed a squad at work and noticed the improvements that were being made. Ap-



Pumping Out a Flooded Well

preciation was expressed by those who were being helped for the type of service which the department was giving. A record was kept of the type, location, and ownership of each well pumped, with the idea that after the emergency had passed considerable useful follow-up work could be done. A total of 5,400 wells and cisterns were pumped, disinfected, and recommendations made for needed physical improvements.

Most of the temporary districts had within them public water supplies which needed reconditioning after the flood waters had returned to their courses. Emergency sources of power had to be secured in some cases to do this and for that purpose tractors and portable gasoline engines proved useful. In one plant, mixing was done by the use of an outboard motor. Disinfection of water mains was essential and for this service the department was fortunate in securing experts from the city of Chicago's Division of Water Purification. Excessively high chlorine residuals were carried in distribution systems for several days. This served

the twofold purpose of sterilizing the mains and of making available to the people a supply of water for washing their homes which had a disinfecting quality. This latter condition had not been planned but many citizens indicated appreciation of water with such a bactericidal effect. After carrying a high chlorine dosage in the mains for several days, it was reduced to normal, and bacteriological examinations were made of samples from the system in the mobile laboratory. If these showed further chlorination necessary, that was done.

With respect to waste disposal facilities, it was originally planned that upon the recession of flood waters, squads of men would provide temporary pits in the rear of residences which had no sewer connections and whose privy buildings had washed away. Instructions regarding the use of such crude facilities were to be tacked on or in each house if the residents had not yet returned. Following these measures it was then proposed to rehabilitate the privies as rapidly as possible. While this plan appeared feasible and appro-

priate, practically it was found to be unworkable. The ground which had been covered with water was so soaked that temporary pits could not be made proof against caving and hence facilities could be provided more quickly by placing reconditioned privy buildings over old pits. Every attempt was made to replace privy structures as they had formerly existed, but there was unquestionably some mixing of buildings. This part of the program was very difficult to administer for many buildings had been entirely washed away or broken up and many pits were left without covering buildings. As a safety measure, pits without buildings were covered with boards or designated as dangerous in some striking way. Due to the failure to secure adequate new material, plans for the construction of new privies on a large scale through the full use of the community sanitation project forces never materialized. However, 3,650 privies were reconditioned and reset.

In municipalities with sewerage systems, cleaning, rodding, and flushing of them presented a separate prob-

lem, but it was successfully surmounted under adequate supervision.

One of the most controversial questions had to do with the unwatering and cleaning of buildings. It was early ruled that this would be undertaken only in buildings which were public and in which people might congregate on occasions. By a rigid application of this rule, this work was in general limited to schools, churches, and hospitals. A total of 127 buildings were cleaned so as to be useable. Removal of mud and debris from streets was assumed to be a local problem and was not included as part of the sanitation program. Promiscuous use of lime was not encouraged, and only one municipality in the area was found to be following this practice. The municipality which had created in its center a high and dry island was struck by a plague of stray animals seeking dry land. No attempt was made by the state to control these as they were not a public health menace at that time. When they became so serious as to be a nuisance, local action took care of them in an expeditious fashion.



The Harrisburg Water Works After 9 Feet of Water Had Withdrawn

When the extent of the flood became evident, emergency orders were given to all municipalities in which refugee camps were located or which were housing refugees that only pasteurized milk should be used. Through the aid of local officials and those engaged in relief work, this action was made generally effective. As a secondary result, the value of milk of this grade in conserving the public health was brought pointedly to the attention of many towns. In Illinois, the control of food-stuffs is a function of the State Department of Agriculture and that department undertook all matters pertaining to damaged foods. However, its field representatives and those of the State Department of Public Health were kept informed of each other's activities and worked in close coöperation. It was found essential for the National Guard to place pickets over rejected food-stuffs consigned to burning or burial; otherwise they were prone to disappear.

An attempt was made through the National Guard to keep people out of damaged homes until they had been restored to a condition not inimical to health, but it was found that the human urge to return home was so great that the plan of control was effective only to a very slight degree. After learning this, provisions were made to care for those wishing to work on their homes so that they could live under habitable conditions.

CONCLUSIONS

Whether the preventive work carried on following a disaster is effective is difficult to prove because of many variables. Furthermore, the history of Illinois contains no flood of the magnitude of that of 1937 and no comparable data are, therefore, available. But the measure of the usefulness of any public health program is the results secured, and it is known that for the flood

period, January 20 to April 3, there were in the flooded section of the state fewer cases of communicable diseases than in any prior and similar period when *normal* conditions obtained. It would seem that the medical and sanitary engineering programs must have played some part in the production of this result. From the engineer's viewpoint, it was gratifying to know that no case of water-borne disease could be traced to the flood. Although one case of typhoid fever was reported, it originated in an unflooded part of the state and the patient was ill upon arrival in the wet section.

Fortunately, the combination of temperature and rainfall which produced this flood is rare, but its rarity is no indication that it will not repeat. Two principles of value for future use made themselves evident in this experience: first, that a practical detailed plan is essential, and second, that such a plan made effective through a scheme of well equipped districts can be made to produce results.

SUMMARY

From January 20 to April 3, 1937, southern Illinois was stricken with a flood which covered 978 square miles and vitally affected over 35,000 people. Pre-flood preparation to protect these people from water-borne diseases and provide the maximum in the way of sanitary surroundings was proved to be possible. A plan for post-flood sanitation involving the use of the district or unit scheme and an effective coördination of all agencies at work in the entire area was followed without undue deviations. The fact that the communicable disease incidence in the area under water and during the period under discussion was less than for a similar period when conditions were normal attests to the successful consummation of the plans.

DISCUSSION

F. C. DUGAN, C.E., F.A.P.H.A.

Chief Sanitary Engineer, State Department of Health, Louisville, Ky.

WE will not attempt in this discussion to cover what should be done by the medical profession, life saving organizations, police, military forces, or relief organizations, but will confine it to the activities in the broad field of sanitation.

DURING THE FLOOD PERIOD

Water Supply—The public water supply is, of course, of paramount importance and no efforts should be withheld to keep it functioning. The area of the community where flood waters have become high and where buildings are being damaged should be cut off from the water supply both for the conserving of water and to prevent contamination of the supply. If in spite of all efforts it is impossible to maintain the public water supply, then arrangements should be immediately made to bring safe water in trucks and tank cars and to use available private sources. Where tank cars or trucks are used they will have to be thoroughly cleaned and sterilized. As a rule, it is advisable to rechlorinate the water brought in in such a manner.

Waste Disposal—Part or all of the sewerage systems will possibly be out of commission, and the immediate construction of sanitary toilets must be undertaken. Arrangements should be made for the collection of garbage and trash, and temporary dumps must be established and maintained.

Milk Supply—In many instances milk pasteurization plants are thrown out of commission and it becomes necessary to bring milk into the city. Pasteurized milk should be brought in in bottles and so distributed where possible. If a pasteurization plant is available, then any milk brought in bulk,

either by tank cars or tank trucks, should be repasteurized.

Refugee Centers—When it becomes necessary to evacuate a large number of people from flood areas, it will be necessary to establish refugee centers to house and feed that part of the population which cannot be cared for in private homes. The sanitary conditions in these refugee centers, the cooking and serving of the food must be carefully supervised, and the medical profession must pay exceptionally close attention to any cases of illness that may occur. It is needless to say that smallpox vaccination and typhoid inoculations should be given.

AFTER THE FLOOD

It is, of course, desirable to return the people to their homes as rapidly as possible, but at the same time efforts should be made to prevent them from returning too soon or else the health officials may face a serious outbreak of disease.

It is therefore necessary immediately to organize cleanup forces, and men experienced in plumbing, electric wiring, and gas systems should be used to make the inspections before permitting people to go back into their homes. Instructions in simple language should be printed and distributed to householders whose homes have been inundated as to how the house should be cleaned and dried out.

Water Supply—If the public water supply has been out of commission, then every effort must be made to rehabilitate the plant rapidly, for a large amount of water will be needed in cleanup. Private water supplies such as wells and cisterns should be cleaned out and then chlorinated.

Sewerage Systems—Steps should be immediately taken to investigate conditions of the sewers and to determine what work will be necessary to put the system if damaged back into commission. Naturally if a sewage treatment plant has been put out of commission, immediate steps should be taken to put the plant in a proper condition. Individual septic tanks will probably have to be cleaned out.

Milk Supply—Milk pasteurization plants which have been inundated should be thoroughly cleaned and given a rigid inspection by competent authorities before being permitted to start operation.

Food and Drugs—In such a catastrophe there is always a large amount of packaged foodstuffs and drugs which have been inundated and also a large amount of fresh or smoked meat and vegetables which have been damaged by flood waters or by lack of refrigeration. Immediate steps should be taken to prevent any of this foodstuff or drugs being sold. In some cases, especially, canned goods, a considerable amount can be salvaged if done under proper supervision. Methods of disposal of such damaged foodstuffs present a definite post-flood problem. Maintenance and policing of dumps are a necessity. Incineration is not always feasible. Burying with other refuse and denaturing with all types of inedible materials offer methods of safe disposal. Some types of foodstuffs can be diverted after denaturing to animal feeding or non-edible uses.

Dead Animals—One of the biggest problems in rural areas is the disposal of dead animals. If there are any rendering or fertilizing plants nearby, they will be of great assistance in the removal of carcasses. Otherwise trenches should be dug and animals buried.

TYPE OF ORGANIZATION NECESSARY

Of course the area affected by the flood will determine in a large measure

the organization of the personnel necessary to handle health activities. The state department of health would naturally be the organization which would be used as the nucleus and its various divisions should be expanded by the addition of temporary employees and voluntary workers. The personnel from the U. S. Public Health Service and other federal agencies and those loaned by other state health departments have always been considered as working under the state health department in the area affected, and during the past emergency this plan worked out very satisfactorily.

Competent sanitary engineers should be given definite areas and they should work in close harmony with the health officer or health officers in their area, making reports to them as well as to the chief engineer of the state department of health. All sanitary engineers, sanitarians, and water laboratory technicians in that area should report directly to the sanitary engineer in charge, and he is responsible for laying out and supervising their work. It is also necessary that sanitary engineers keep in close touch with city officials and relief organizations who can furnish the labor for cleanup purposes.

Food and drug inspection, condemnation and destruction will naturally be handled by the department which has jurisdiction whether it is the state department of health or some other bureau of the state government. The federal food and drug inspectors who will be sent in will report to and work under that department.

In giving a discussion of this topic in a limited time, it is only possible to touch upon the main points of a general plan. In all probability, details will have to be worked out for each area, for much depends upon the character of the area, the population, and the caliber of the man put in charge of that area.

Visual Education for Schools*

PAULINE BROOKS WILLIAMSON, F.A.P.H.A.

Chief, School Health Bureau, Welfare Division, Metropolitan Life Insurance Company, New York, N. Y.

VISUAL education in its broadest sense includes all learning in which seeing is involved. As the sense of sight is the main street, so to speak, over which impressions from the outside world reach the human brain, it is practically impossible to set boundaries for visual education.

The materials for use in learning through seeing are as limitless as the field it covers. Everything that meets the eye in the outside world is a potential architect of new or changed meanings in the inner world of the mind. What one sees may even give the lie to what one has learned in other ways. But although the possibilities of visual education are limitless, in actual practice learning through seeing is limited.

First, mere *seeing* is not learning or observing. Each one of several people looking at the same scene will receive impressions different from those of any other in the group. An artist's observation of a cornfield, for example, will be very different from that of a farmer's son or a city boy.

"Seeing is believing" is an axiom with a corollary, which may be expressed by saying that "seeing is believing what one is prepared to believe."

The visual education of each in-

dividual is limited by the powers of observation and by the particular interest and mental training of each individual. If we wish children really to see certain things they must be given some indication of what to look for, remembering always that what each child sees has been passed through the filter of his personality and can never be identical with what another person sees.

A second limitation placed on the scope of visual education is the *selection* of what is to be seen. There is no question "that visual material is lying all about us waiting to be used." The point is that it is impossible to use all of it to supplement book learning or to motivate desirable practices. Visual material must be selected from the mass for a particular educative purpose, and the purpose is what will determine the use of the material. The sun and moon and stars are visual education materials and how many ways there are of looking at them!

A museum of health for which the children themselves may make or collect the exhibit is a visual education project which has far-reaching possibilities. But before discussing this health museum idea it is well to emphasize the fact that visual education in the field of health presents a far more complex problem than the gathering of material to illustrate factual teaching. It must take into account the

* Read before the Public Health Education Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

appearance and the behavior of all individuals who meet the eyes of children—teachers, administrators, parents, physicians, nurses, specialists, playmates.

This visual education problem is peculiar to the teaching of health. In teaching history, for example, the teacher does not need to have an historical face. The people who have faces capable of sinking a thousand ships do not teach history; they make it. But there is no doubt that in teaching the principles of healthful living it is highly desirable for the teacher to look healthy and to be healthy. She becomes an exhibit of what to look like and how to behave, and of what not to look like and how not to behave, which is more effective than anything she may say. If a teacher tells her students not to put their fingers in their mouths and then absent-mindedly moistens her own fingers with her lips in order to turn the pages of a book, no scientific study will be needed to indicate which has been more effective—what the teacher said or what the students saw her do.

It is not only the appearance and the habits of the teacher and of all other people whom her students admire that she must take into account as visual education materials, but also she must consider the influence of the students' complete environment. This involves the coöperation of many different people of varied interests, professional background, and experience—from the custodian who takes care of the school building to the architect who designed it. It involves also the coöperation of parents, city officials, and all others who are concerned with the child's environment away from school.

There is no question that certain factors in the students' environment may detract from health teaching by giving them eye-witness evidence of the fact that precept and practice may

live in a state of separation if not complete divorce. For example, many a teacher has been obliged to resort to makeshifts in her endeavor to teach children to wash their hands before eating and after toilet because there were no handwashing facilities in the school. The perfect visual education material for teaching the practice of handwashing is the sight of warm running water, soap, and individual towels in the washroom. Lacking these in a school where children eat their lunches of what possible use is it for the teacher to say: "Always wash your hands with warm water and soap before eating." All other visual education materials, such as bacterial cultures from dirty fingers grown by the children themselves on gelatine or agar media, become insignificant if the children are permitted to see *with their own eyes* that the handwashing facilities in school are either lacking or inadequate.

Although doing has more effect on one's health than studying about what should be done, reasonable people insist on knowing why certain health habits are essential. The importance of visual materials in providing concrete imagery is fully recognized, and high standards for the selection and quality of these materials are being attained in certain fields of education, such as art and history, but high standards in the choice of visual materials in the field of health education have not been generally adopted. There is no reason for this situation and you can do much to create a sentiment and a demand for higher standards as well as contribute practical suggestions for improvement.

It is important for health specialists to become familiar with the fine work in visual education that is being done in science, history, and art classes, and to help leading educators to become conscious of the visual materials

in the health education field which are rich in educational value and which are capable of reaching equally high standards of art and workmanship.

To encourage creative ability among young people and at the same time to develop an appreciation of modern health practices, the building of museums of health by children is being recommended. These will require the coöperation of all school departments, creativeness on the part of the students, and continuous growth in the quality of the exhibits in order to maintain high educational standards.

The museum idea for children is not new. Neither is it new to have children make and collect materials for a museum; but a suggestion which has not yet been carried out is that there be a national child health museum made by the children themselves and kept constantly changing and growing by continuous "feeding" from individual children and local communities. In other words, the national museum will grow from the efforts of each child in coöperation with the community as a whole.

There are infinite possibilities in such a project which may begin in a single classroom and spread from one school and community to another. If the exhibits worked out during the coming year warrant the enthusiasm now evidenced by the educators to whom the idea has been broached, it is not difficult to conceive the ultimate establishment of a national museum to which the best models and those of most lasting significance can be sent. However, the starting point should be the formation of local museums of health. In the development of these, creativeness, coöperation, and continuous growth are the important educational features. Working on exhibits for the museum will not only stimulate the student to fresh creation, but will also make him conscious of the constant

state of flux and advance in health matters.

The health museum would capitalize on two interests that are almost universal—(1) collecting materials, and (2) making things. We do not have to create interests for children. They bring them to school. All we need to do is to recognize these interests and give the children an opportunity for expression. As one supervisor states: "When a child comes to school with a loose tooth, there is no reading, writing, or arithmetic which can possibly compete with it in interest, and I consider a loose tooth very important material in school health education." Many children are interested in making a collection of their first teeth as they fall out. A collection of animals' teeth will arouse interest in any school. Various types of shoes may be collected in practically any locality. Little stories about the shoes exhibited may be printed on the labels, giving the dates when they were worn. Collections of different types and sizes and materials of handkerchiefs offer many opportunities for health teaching. An exhibit may be planned to show the evolution of the handkerchief with historical details for the labels such as: "We use square handkerchiefs because Louis XVI issued an edict which read: 'The length of handkerchiefs shall be equal to their width throughout my kingdom.'" An exhibit of the handkerchiefs of today would include soft paper tissues and the cellophane envelopes which are advocated for the bestowal of handkerchiefs both in pockets and in pocketbooks.

In the making of models the child will acquire much valuable health information. The more of this he seeks spontaneously the greater will be its educational value for him. If his bent is historical, he may wish to build a model of a Roman aqueduct; if

modern, he may be interested in showing some phase of the water supply system or the lighting system in his own community. If he likes to read about outstanding men and women who have by scientific research contributed to the advancement of public and personal health, he may wish to dramatize in model form important scenes in their lives. This will give an outlet for artistic as well as constructive ability, and will also acquaint the student with ways of getting needed source material. Making models of aqueducts built in different eras; a series of houses which represent progress in lighting, ventilation, and adaptation to climate; human figures engaged in occupations which illustrate various aspects of preventive medicine and nursing; are all among the possibilities which appeal to the child's dramatic instinct and to his love of construction.

Facility in various crafts, such as wood-carving, weaving, and painting can be displayed to advantage and will give the student a sense of achievement. A project requiring different types of craftsmanship will develop coöperative experience in a class working on the various parts of the model scene.

Before starting to make the models it will often be wise for the children to make observation trips, look up source material, do some historical reading, and collect pictures as guides. The children should be made to feel from the outset that it is their museum, and guidance should be of a directional type and not interfere with their initiative and creativeness.

A child health museum is the type of project in which fathers and mothers will readily become interested. With their interest added to the children's enthusiasm there is the possibility of rousing community action for the advancement of health.

In discussing the practical aspects

of this "museum hobby" with city and rural supervisors on the East and West Coast, in Canada, and in the South, enthusiasm for the idea has been unanimous. Each person consulted had some suggestions to offer based on his particular subject interest, or on the environmental stimuli of his state or community.

As vital as a growing health museum may become in a school program it must not, of course, become an aim in itself. The children's own drinking fountains or individual drinking cups, and their own seating, lighting, and ventilation problems are more important than any museum. They present real life situations. If the museum in any way sidetracks the attention of teacher or students from securing the fundamental tools of healthful living, it becomes a hindrance rather than a help.

There are many good references for people who are interested in the museum project as a method of visual education in the field of health.

In *Fortune*, for April, 1937, an article entitled "American Museum" describes a survey being conducted to answer such questions as: What exhibits attract people most? How long do they stand before any of them? Do they read the labels? Certain definite facts have been deduced from this and similar surveys. A dead-end hall, for instance, will not entice so many people as one open at both ends. A good 70 per cent of visitors observe the right-hand side first. Most people don't like a mechanical display that moves all the time, but if they have something to do with bringing about the motion, the exhibit fascinates them. Most people will not read labels under any circumstances.

There are, of course, a great many more opportunities for visual education in the field of health than the building of working models and ex-

hibits for a museum. A partial list of these would include:

Field trips to dairies, farms, water supply systems, health department laboratories, and other enterprises affecting community health

Photographic and printed material

Charts, diagrams, posters, wall runners, lantern slides, film slides, and microscopic slides made and exhibited in school

Health and safety motion pictures and film strips

Window boxes and aquaria

The use of the microscope in exploring the world of the very small

Dramatizations—for which the students make the costumes and scenery—of scenes in the lives of health heroes, of stirring incidents in man's search for health, and of desirable health practices

The making and dressing of puppets and giving puppet shows

In fact, practically all the devices that are used in school as visual aids in the teaching of the physical, chemical, and biological sciences, the social sciences, English, and mathematics also may be used in the teaching of health as a curriculum subject.

The thing to remember, however, is that health depends principally on doing. If interest in the visual aid or in the knowledge gained by using it is not helpful in establishing healthful living as a way of life, then visual education as a teaching technic has no place in the health education of an individual. It may be taken as a fundamental principle of health education, as it is of all education, that each

child must be given an opportunity to live at his best. The enrichment of the mind and the sound satisfaction of having a reasonable understanding of the meaning of healthful living are certainly commission enough for making health teaching a part of the curriculum. But to make health a part of life, life itself must supply the materials for use in visual health education.

Valuable references on the philosophy of visual education are *Visualizing the Curriculum*,¹ October, 1936, number of *Progressive Education*² which has as its general theme "experience through observation," and the 1937 *Yearbook of the New York Society for the Experimental Study of Education*.³

Accounts of practical experience are given in the Addresses and Proceedings of the National Education Association each year,⁴ and valuable information is found in the *National Visual Education Directory*.⁵

REFERENCES

1. Hoban, Charles Francis, Hoban, Charles Francis, Jr., and Zissman, S. B. *Visualizing the Curriculum*. New York: Cordon Co., 1937.
2. *Progressive Education*, 13, 6 (Oct.), 1936. 310 West 90 Street, New York, N. Y.
3. *Yearbook of the New York Society for the Experimental Study of Education* (1937). William Jansen, President, 500 Park Avenue, New York, N. Y.
4. *Addresses and Proceedings of the National Education Association*. 1201-16th Street, N.W., Washington, D. C.
5. Koon, Cline M., and Noble, Allen W. *National Visual Education Directory*. American Council on Education, Washington, D. C. 1936.

Adaptation of the International List of Causes of Death to Changing Needs of the Medical Profession and Public Health Groups^{*}

HALBERT L. DUNN, M.D., PH.D.

*Chief Statistician for Vital Statistics, Bureau of the Census,
Washington, D. C.*

THE practising physician and public health worker have long been familiar with the processes of collection of death certificates and the published tabulations on cause of death. However, they do not usually appreciate the serious restrictions surrounding and limiting the reliability of the statistical data on cause of death until they become interested in the details concerning a particular disease.

For almost a century the nations of the civilized world have been working toward the development of a uniform system for reporting causes of death. As a result of international coöperation, the *International List of Causes of Death* has been adopted in most of these countries. This list has now undergone several revisions at successive 10 year periods, and will again be revised in the fall of 1938 for the decade 1940-1950.

The Committee on Accuracy of Certified Causes of Death, a sub-committee of the American Public Health

Association, has the duty of inspecting, assimilating, and organizing the various ideas of physicians and health workers as to the changes which should be involved in the revision of the *International List*. Official suggestions for changes to be proposed by the United States for the next decennial revision must be sent to Paris not later than November 1 of this year.

An assumption commonly made by the health worker is that the problem of securing comparable mortality statistics will be solved if satisfactory readjustments can be made in the *International List of Causes of Death*. It is true that such adjustments are essential in order to modernize the List and to bring it into alignment with advances in medicine. However, other factors are involved in the production of statistical comparability of tabulations based upon the rubrics of the List. Among these are such items as: The necessity of keeping statistical comparability over time periods during which the List is being changed; adjustment to the constant growth and change in terminology essential to the expanding field of scientific medicine; correction for inaccuracies in the origi-

^{*} Read before the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

nal notations on cause of death as written by the physician; and the need for a consistent methodology in the selection of the primary cause of death to be tabulated when several causes are noted on the certificate.

PROBLEMS INVOLVED

The fundamental basis for a satisfactory adaptation of the *International List* to the purpose of producing comparable mortality statistics depends upon the accuracy of the cause of death statement on the certificate.

In certain instances, the cause of death is not accurately recorded by the physician due to the necessity of protecting the interests of the patient. One school of thought maintains that a considerable improvement in death information would result if the medical report on the death certificate were made confidential. Such a system exists in Switzerland and Holland. The belief is that if the cause of death information were confidential and used for statistical purposes only, resultant mortality data would be more accurately reported. Experiments were conducted in Westchester County, N. Y., to determine the degree of inaccuracy in the reporting of death from alcoholism and syphilis. It was demonstrated that only about one-half the deaths of these types had been recorded. New York City, at the present time, is considering the possibility of adopting a confidential certificate.

The errors in cause of death due to carelessness on the part of the physician in filling out the death certificate are probably fully as numerous as those arising from his desire for a confidential record. Many times the certificate is written by interns in the hospital, or by physicians uninterested in the accuracy of the facts which they note on the certificate. Correction of carelessness will be purchased only at the cost of constant training in medi-

cal schools and medical societies as to the value of accurate death information. Eternal vigilance is essential in the querying of unsatisfactory terminology.

The struggle for more uniform use in medical terminology is unending. In many instances, terms are either vague or colloquial in nature. In connection with this problem, it is the hope of the Sub-committee on Accuracy of Certified Causes of Death to establish a list of approved terms in the next revision of the *International List*. However, there are many non-approved terms in common use by physicians which are more or less synonymous with approved terms. Sometimes the names of operations or therapies are listed in lieu of a statement as to the cause of death. Yet, even though the particular operation might be stated on the certificate, the cause of death is not necessarily clearly indicated.

The accuracy of the cause of death varies from one certificate to another. In some instances, autopsy, operation, or laboratory findings exist which result in a more accurate knowledge of the true cause of death than when a clinical diagnosis only is available. Moreover, there is considerable variation in cause of death statements due to the great difference in the training of physicians.

The fact of duration of illness was introduced on the death certificate in 1930. This was done that it might be possible to obtain a sequence in disease conditions so that the primary disease could be ascertained with more accuracy. However, at the present time, statements on duration are filled out in only relatively few death certificates. This raises the question, to be considered later, as to what would be the best way to ask the questions on the death certificate in order to elicit a causal sequence when multiple

causes are involved in the same case.

The problem of when and how to query causes of death which are inadequately described is most important if comparability in mortality statistics is to be achieved. In the past, many queries have been sent directly to physicians by the Bureau of the Census. Such queries of necessity were mailed to the doctor from 9 to 12 months after he had filed the certificate. This aggravated him in many instances—and justly so. A query at so late a date that the facts of the case are vague is of little value. An attempt is being made in some states at the present time to take over the query function in the state health department. Such queries can be made by the state within a month or two after the death of the patient. An even better solution is to have some physician in the county, perhaps the county health officer, scan the death certificates before they leave the county in which they are filed. Poor terminology on the part of the physician is more easily corrected if the circumstances surrounding the death are still fresh in his mind.

In addition to these considerations involving the accuracy of the original information, there are other factors affecting the statistical comparability of mortality data which are directly linked with the use of the *International List*. Some of these involve changes in definitions of medical phrases or terms, the establishment of approved terms and their synonyms, and the deletion of colloquialisms or vague phrases which are more or less meaningless. In general, this function is that of the Sub-committee on the Accuracy of Certified Causes of Death. Among other items of this nature which the sub-committee must consider is the fact that many conditions in the *International List* are essentially terms for morbidity rather than mortality, and that such terms should be deleted since these con-

ditions do not add to the risk of dying.

After the terms to be used in the list are selected, a real problem arises as to how they should be classified in order to be of the maximum use to medical and health groups. Physicians investigating a particular cause of death and trying to use statistical facts tabulated according to the *International List* frequently find that the rubrics of the List are not satisfactory for their purposes. Obviously, the number of rubrics in the List must be limited. This means that, in many instances, conditions must be grouped together which are only partially related to each other. In general, the procedure followed is to keep certain titles in the List quite specific in character, while others are miscellaneous. Rubrics for miscellaneous categories pool together rare causes of death and conditions which are vague or relatively meaningless from a statistical standpoint. This pooling of terms under certain statistical rubrics frequently involves the misallocation of certain causes of death so that the information cannot be re-accumulated later in a form desired by the physician. For instance, physicians interested in heart feel that death from rheumatic heart conditions is a recognized entity. Yet at present in the *International List* rheumatic heart conditions are separated into several titles and pooled with other terms listed therein.

The problem of what terms should be included in the index of the *International List* is another controversial problem. At present the index is most complete. It includes not only the more or less approved and commonly used terms, but also unsatisfactory ones. This is due to the fact that, regardless of the amount of querying, there are many death certificates which must be coded in some manner by clerks. Code clerks must be instructed

as to what numbers they should give to unsatisfactory terminology when nothing else is available.

Statisticians have a pet grievance of their own with the *International List*; it involves the change in code numbers at a decennial revision. The widespread use of the List by large statistical organizations in health and insurance means that endless confusion results in the coding of mortality data at these times. Code clerks must be re-trained to the use of new numbers. Tabulating difficulties are many if breaks in the continuity of cause of death data are to be avoided.

Still another major difficulty from the standpoint of obtaining comparability in mortality statistics through the *International List* is the method used in the selection of the primary cause of death. In England and the United States, about one-half of the death certificates contain more than one cause. These causes may be related or totally unrelated to each other. Unless uniform methods are employed in selecting the primary cause of death, the results will lack comparability due to this difference in selection. Some countries, like the United States, use a manual which describes an arbitrary method for choosing the primary cause of death. Others, such as England, are developing a technic which permits the physician to select the primary cause.

In order to obtain some idea of the degree of uniformity existing among nations in the selection of the primary cause, the Bureau of the Census mailed a list of two or more causes of death taken from 1,032 transcripts to 46 nations in 1935. The 1,032 transcripts were copies of actual death certificates. They were selected as representative of problems in the coding of the primary cause of death rather than as a random sample of death certificates.

To date, 15 nations have answered the questionnaire. The percentage

agreements of the 15 nations with the United States and England are tabled. These relative agreements were computed for all 1,032 deaths, and separately for the 89 infant deaths, 70 puerperal, 54 tuberculosis, and 66 cancer deaths in the series.

Except in cancer, where coding similarity is high, the average percentage agreement in the selection of the primary cause of death is in the neighborhood of 60 per cent. Only in puerperal deaths is the average agreement with the United States significantly larger than with England.

The study indicates that international comparability of mortality statistics cannot be achieved without a solution of this problem.

POSSIBLE SOLUTION TO PROBLEMS INVOLVED

A solution of the above problems should make possible a high degree of comparability in mortality statistics, and consequently, an adequate adaptation of the *International List of Causes of Death* to the changing needs of the medical profession and the public health groups.

The possibility of changing the medical notation of the cause of death on the death certificate to a confidential record is being studied in New York City at the present time. It is likely that this feature cannot be introduced into the mortality statistics of the United States since the death certificate is commonly used as a public document. As a matter of fact, it is not at all certain that better statistics would result if the cause of death statement were confidential. No reliable assay of the increased accuracy of the systems in Switzerland and Holland have been made.

Continued advance can be expected in the establishment of approved terminology for causes of death. Specialized medical groups are coöperating at the

AGREEMENT IN SELECTION OF PRIMARY CAUSE OF DEATH

Nation	Total Deaths Agreement with		Infant Deaths Agreement with		Puerperal Deaths Agreement with		Tuberc. Deaths Agreement with		Cancer Deaths Agreement with	
	U.S.	E.W.	U.S.	E.W.	U.S.	E.W.	U.S.	E.W.	U.S.	E.W.
	%	%	%	%	%	%	%	%	%	%
United States	..	62	..	50	..	53	..	72	..	98
Eng., Wales	62	..	50	..	53	..	72	..	98	..
Australia	85	65	89	48	80	60	95	72	94	95
Belgium	46	47	40	44	45	51	47	58	54	55
Canada	61	72	58	73	76	68	89	65	88	90
Ceylon	89	65	89	53	84	44	97	74	95	93
Denmark	59	72	58	60	69	39	61	68	95	95
Holland	56	63	59	56	64	58	49	50	86	88
Italy	58	61	62	59	63	56	74	68	83	90
New Zealand	81	64	81	49	77	37	87	77	98	97
Philippine Islands	83	64	80	53	79	56	87	75	93	93
Scotland	60	59	48	59	63	60	65	81	94	93
Spain	44	48	56	51	41	54	45	51	65	66
Sweden	52	62	56	64	54	38	40	74	79	81
Turkey	40	35	48	49	39	47	43	44	61	63
Un. of S. Africa	50	65	56	63	62	76	57	79	87	95
Mean (Average)	61.7	60.3	62.0	55.4	63.3	52.5	67.2	67.2	84.7	86.1
P.E. of Mean	±2.7	±1.7	±3.3	±1.3	±2.5	±1.6	±3.5	±2.0	±2.4	±2.4
Standard Deviation	15.1	9.5	18.2	7.4	14.0	9.1	19.5	11.0	13.5	13.2
P.E. of St. Dev.	±1.9	±1.2	±2.3	±0.9	±1.8	±1.2	±2.5	±1.4	±1.7	±1.7
Difference in Means	+1.4		+6.6		+10.8		0.0		-1.4	
P.E. of Dif. in Means	±3.2		±3.5		±3.0		±4.0		±3.4	
Diff. in Stand. Devia.	+5.6		+10.8		+4.9		+8.5		+0.3	
P.E. Dif. in Stand. Deviation	±2.3		±2.5		±2.1		±2.8		±2.4	
Coeff. of Correlation	+0.47		-0.12		+0.40		+0.54		+0.98	
P.E. Coeff. of Correla.	±0.14		±0.18		±0.16		±0.13		±0.01	
No. Cases Coded by Each Country	1,032		89		70		54		66	

present time with the Sub-committee on Accuracy of Certified Causes of Death in the selection of such proposed terms. It has been suggested by the committee that, in the next printing of the *Manual of the International List*, only approved terms will be listed under the rubrics in the tabular part of the List, and that these approved terms be set forth in bold faced type in the index of the *Manual*.

It will be possible in the revision of the *Physician's Pocket Reference*,

dealing with the use of the *International List of Causes of Death*, to introduce not only a complete list of the rubrics but also an index of the approved and commonly used medical terms. By doing this every physician will have available a list of the approved terms. A more homogeneous notation of causes of death should result.

A study is now being undertaken by the Bureau of the Census to separate all medical terms, good and bad, which

are used in the index of the *International List* into 3 groups: those which are approved by the sub-committee as the most desirable; those which are vague in meaning and undesirable; and those in common use by the medical profession but not on the approved list. Each of these 3 groups will be divided in turn into 2 groups—those conditions which can cause death and those which cannot. When this task has been accomplished the statistics from the death certificates of selected areas will be coded accordingly and the percentage frequency under each international statistical rubric, based upon approved and nonapproved terms or upon terms which can or cannot cause death, will be tabulated. As a result of such a study, considerable knowledge will be obtained as to what terms can or cannot be deleted from general usage in notation of cause of death.

A study of a similar nature is planned for 1940, simultaneously with the introduction of the revised *International List*. The plan is to tabulate all of the important alterations in the List. By doing this, tables can be published in 1940 which will be comparable with both the years 1939 and 1941. A knowledge of the relative change produced by shifting certain causes of death from one rubric to another will serve to bridge the gap between the old and the new practice.

Likewise, when medical groups desire to make important changes from time to time in the content of a particular rubric in the List, they can send such suggestions to the Sub-committee on Accuracy of Certified Causes of Death. The Bureau of the Census is willing to assay the more important of the desired breakdowns for an experimental year. It plans to tabulate such statistics and furnish the sub-committee with information on the amount of change involved if the recommendations are followed.

Whenever possible, studies will be conducted on the effect of autopsy information or the existence of laboratory and surgical findings upon the accuracy in diagnosis of cause of death. For instance, at the present time, the Health Department of Chicago is conducting a special study based on autopsy findings in infant mortality. This has resulted in an advance in the knowledge of the true causes of death in the first year of life. The discrepancies which exist in Chicago mortality statistics as tabulated with and without autopsy knowledge have resulted in a better understanding of these mortality facts. It is hoped that studies of this type will be made from time to time by local groups. However, it is not to be expected that the physician will ever have the advantage of autopsy findings available in the majority of deaths. In fact, the physician is frequently not sure of the diagnosis which he records, although he might be reasonably certain that it is one of two or three conditions. The degree of sureness which he feels concerning his diagnosis as to the cause of death should be recorded and introduced in mortality statistics.

Recognizing the difficulties of obtaining accuracy in cause of death data, there is still room for considerable advancement in accuracy if the cause of death questions on the certificate could be asked in such a way as to elicit the best possible answer from the physician. It may seem a relatively simple matter to formulate the questions as to cause of death in a manner that will obtain from the physician the exact information desired. However, the experience of various countries which have studied this question leaves no doubt that it is a complex and difficult problem. The difficulties arise from those cases which involve more than one cause of death.

Realizing the great importance of ac-

UNITED STATES STANDARD CERTIFICATE OF DEATH
(Example inserted)

The principal cause of death and related causes of importance were as follows:	
Fracture neck of femur	Date of onset 10 days
Fall down stairs	10 days
Bronchopneumonia	4 days
Other contributory causes of importance:	
Chronic arthritis	- - -
Arteriosclerosis	- - -

ENGLAND AND WALES CERTIFICATE OF DEATH
(Example inserted)

I. CAUSE OF DEATH	
Immediate Cause	a. Bronchopneumonia
	due to
Morbid conditions, if any, giving rise to immediate causes (stated in order proceeding backward from immediate cause)	b. Fracture neck femur
	due to
	c. Fall downstairs
II.	
Other morbid conditions (if important) contributing to death but not related to immediate cause	Arteriosclerosis
	Chronic arthritis

in the United States and in England. Differences exist between countries in their methods of determining the primary cause of death which is to be tabulated. Some countries, like the United States, use a *Manual of Joint Causes of Death*, which describes an arbitrary method for choosing the primary cause of death. After considerable experimentation, the English came to the conclusion that the best solution lies in a system mainly based on the certifying doctor's opinion. Authorities in this country feel that such a plan would distort the comparability of our statistics on death.

Perhaps a compromise plan for the United States would be the addition of a question to the cause of death statement on the death certificate, such as: "To which multiple cause should death be assigned?" The physician's

answer to this question could then be tabulated independently from routine death information based on the primary cause of death as selected by the *Manual of Joint Causes of Death*. By this expedient, the results of the physician's opinion could be obtained without interfering with the comparability of statistics on cause of death.

It is doubtful if comparability in the interpretation of death rates can be achieved, *regardless of the method used in the selection of the primary cause of death*, until more real knowledge is obtained about the contributory causes of death. Tabulations of contributory causes would show the extent to which certain diseases are important factors in causing death even though they might not be selected as primary. For instance, the over-all typhoid rate for a community has as much, if not more, significance to the health department than has the death rate in which typhoid fever is listed as the primary cause. The extent to which each disease is associated with other diseases must be known if the true risks of death are to be equated. Even within a given community, the death rate of certain causes of death can be non-comparable in two successive years, not because of the particular disease in question, but due to its association with some contributory cause of death which varies markedly in the successive year. This was particularly true in the influenza epidemic of 1918 for causes of death which took priority over influenza.

In view of these considerations, and after discussion with authorities in a number of European countries, it has been suggested to nations using the complete *International List* that they tabulate multiple causes of death for a trial year or two. Such a tabulation is planned for the deaths of 1936 in the United States. A number of nations—England, Scotland, Denmark,

Switzerland, Canada, Turkey, New Zealand, and Norway—have agreed to produce similar tables. As a consequence, the subject will receive consideration at the International Conference for Revision of the *International List of Causes of Death* in the fall of 1938.

It is likely that ideas concerning mortality will shift considerably when such contributory cause of death tabulations become available. For example, traffic control officers have questioned the fact that accidental deaths are assigned at times as traffic deaths when some other condition, such as pneumonia following the accident, has been the immediate cause of death. The relative unimportance of this criticism is seen in the statistics for Maryland in 1935 which show that 78 per cent of all motor vehicle accidents coded as primary causes had no other contributory cause whatsoever. In the remaining group of motor vehicle accidents, the bulk of the cases, which had contributory conditions, were involved with the following diseases: apoplexy, heart and arterial (50 per cent); pneumonia and respiratory causes of death (27 per cent); septicemia (blood poisoning) (7 per cent); and a miscellaneous group of diseases of one or two cases each (16 per cent). In practically all of these conditions, death would not have resulted if the accident had not initiated the sequence of events leading to death.

CONCLUSION

In the adaptation of the *International List of Causes of Death* to the changing needs of the medical profession and public health groups, the essential goal to be achieved is the production of comparability in mortality statistics.

This cannot result simply by alterations in the *International List*. The major problem also involves the

UNITED STATES STANDARD CERTIFICATE OF DEATH
(Example inserted)

The principal cause of death and related causes of importance were as follows:

Fracture neck of femur

Date of onset
10 days

Fall down stairs

10 days

Bronchopneumonia

4 days

Other contributory causes of importance:

Chronic arthritis

- - -

Arteriosclerosis

- - -

ENGLAND AND WALES CERTIFICATE OF DEATH
(Example inserted)

I.

CAUSE OF DEATH

Immediate Cause

a. Bronchopneumonia

Morbid conditions, if any, giving rise to immediate causes (stated in order proceeding backward from immediate cause)

due to

b. Fracture neck femur

due to

c. Fall downstairs

II.

Other morbid conditions (if important) contributing to death but not related to immediate cause

Arteriosclerosis

Chronic arthritis

in the United States and in England.

Differences exist between countries in their methods of determining the primary cause of death which is to be tabulated. Some countries, like the United States, use a *Manual of Joint Causes of Death*, which describes an arbitrary method for choosing the primary cause of death. After considerable experimentation, the English came to the conclusion that the best solu-

tion lies in a system mainly based on the certifying doctor's opinion. Authorities in this country feel that such a plan would distort the comparability of our statistics on death.

Perhaps a compromise plan for the United States would be the addition of a question to the cause of death statement on the death certificate, such as: "To which multiple cause should death be assigned?" The physician's

answer to this question could then be tabulated independently from routine death information based on the primary cause of death as selected by the *Manual of Joint Causes of Death*. By this expedient, the results of the physician's opinion could be obtained without interfering with the comparability of statistics on cause of death.

It is doubtful if comparability in the interpretation of death rates can be achieved, *regardless of the method used in the selection of the primary cause of death*, until more real knowledge is obtained about the contributory causes of death. Tabulations of contributory causes would show the extent to which certain diseases are important factors in causing death even though they might not be selected as primary. For instance, the over-all typhoid rate for a community has as much, if not more, significance to the health department than has the death rate in which typhoid fever is listed as the primary cause. The extent to which each disease is associated with other diseases must be known if the true risks of death are to be equated. Even within a given community, the death rate of certain causes of death can be non-comparable in two successive years, not because of the particular disease in question, but due to its association with some contributory cause of death which varies markedly in the successive year. This was particularly true in the influenza epidemic of 1918 for causes of death which took priority over influenza.

In view of these considerations, and after discussion with authorities in a number of European countries, it has been suggested to nations using the complete *International List* that they tabulate multiple causes of death for a trial year or two. Such a tabulation is planned for the deaths of 1936 in the United States. A number of nations—England, Scotland, Denmark,

Switzerland, Canada, Turkey, New Zealand, and Norway—have agreed to produce similar tables. As a consequence, the subject will receive consideration at the International Conference for Revision of the *International List of Causes of Death* in the fall of 1938.

It is likely that ideas concerning mortality will shift considerably when such contributory cause of death tabulations become available. For example, traffic control officers have questioned the fact that accidental deaths are assigned at times as traffic deaths when some other condition, such as pneumonia following the accident, has been the immediate cause of death. The relative unimportance of this criticism is seen in the statistics for Maryland in 1935 which show that 78 per cent of all motor vehicle accidents coded as primary causes had no other contributory cause whatsoever. In the remaining group of motor vehicle accidents, the bulk of the cases, which had contributory conditions, were involved with the following diseases: apoplexy, heart and arterial (50 per cent); pneumonia and respiratory causes of death (27 per cent); septicemia (blood poisoning) (7 per cent); and a miscellaneous group of diseases of one or two cases each (16 per cent). In practically all of these conditions, death would not have resulted if the accident had not initiated the sequence of events leading to death.

CONCLUSION

In the adaptation of the *International List of Causes of Death* to the changing needs of the medical profession and public health groups, the essential goal to be achieved is the production of comparability in mortality statistics.

This cannot result simply by alterations in the *International List*. The major problem also involves the

methods of collecting the data and the stimulation of accuracy in the recorded data. Suggestions are made in this

paper by which some of the factors affecting statistical comparability can be evaluated and remedied.

Keeping Well

"The growth of science and the applications of science to practical affairs have no doubt brought, along with their advantages, serious difficulties. There is no ancient wisdom to guide us in the new circumstances. Keeping well has come to be increasingly dependent upon individual and social activities that receive their direction from science: the new conditions have to be studied intensively and systematically by the very methods that have brought them to be. We cannot return to nature. The remedy for the difficulties created by science is to be found in more science.

"The changes brought about by the industrial revolution have another bearing upon health that is becoming ever more obvious. Heretofore ill health or suffering was almost entirely the concern of the individual in distress and of his immediate relatives and friends. As time goes on the illness of individuals comes to be a matter of far-reaching social significance, in the political and economic phases. We know, of course, that a sick individual may become a menace to the health of his neighbors as a source or as a means of infection. Aside from this, how-

ever, the increasing complexity of our lives sooner or later makes the individual whose health is not up to standard a burden to others.

"In his industrial relations, the sick or ailing person is unable to carry his share of the total burden of work. He demands more than his share of overhead costs and of supervision. He often slows down the production of others, or adds to the hazards of their work. His incapacities eventually call for retirement and support at an unduly early age. Just as it is of advantage for every individual in the community that his fellow citizens be as intelligent, and well informed, and competent as possible, it is of advantage to every one of us to have everybody as well as possible: a large part of the waste and cost of illness falls upon the community, directly or indirectly. Those who are not themselves decidedly below normal must recognize that they are being unavoidably taxed by the hygienic shortcomings of others."—From a report on "A Museum of Health," by Benjamin C. Gruenberg, Ph.D., for the Committee on American Museum of Hygiene of the American Public Health Association.

A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass.*

W. G. SMILLIE, M.D., F.A.P.H.A., G. H. WARNOCK, M.D.,
AND HAROLD J. WHITE

Director, Division of Public Health, Cornell University, New York, N. Y.; Junior Epidemiologist, State Department of Health, Albany, N. Y.; and Bacteriologist, Harvard School of Public Health, Boston, Mass.

AN epidemic of 110 cases of lobar pneumonia, which occurred at the State Hospital in Worcester, Mass., during the early months of 1937, offered an unusual opportunity to study the epidemiology of Type I pneumococcus infections.

We shall first present, in brief, the organization of the hospital. We shall then describe the epidemic as it swept through the institution, and indicate the various steps that were taken to check its spread.

DESCRIPTION OF THE HOSPITAL

The State Hospital for mental diseases at Worcester, Mass., has a fairly constant adult population of about 2,400 patients and 600 employees. It is well organized and expertly administered. It consists of two parts: the Main Hospital with some 1,800 patients and 500 employees, and the Summer Street Division with 600 patients and 100 employees. Summer Street Division is essentially an overflow hospital, to

which patients are transferred when approaching their period for discharge. It is 3 miles from the Main Hospital, and has its own separate staff, which has little contact with the Main Hospital staff. It receives no new patents, but admits only those patients that are transferred from the Main Hospital.

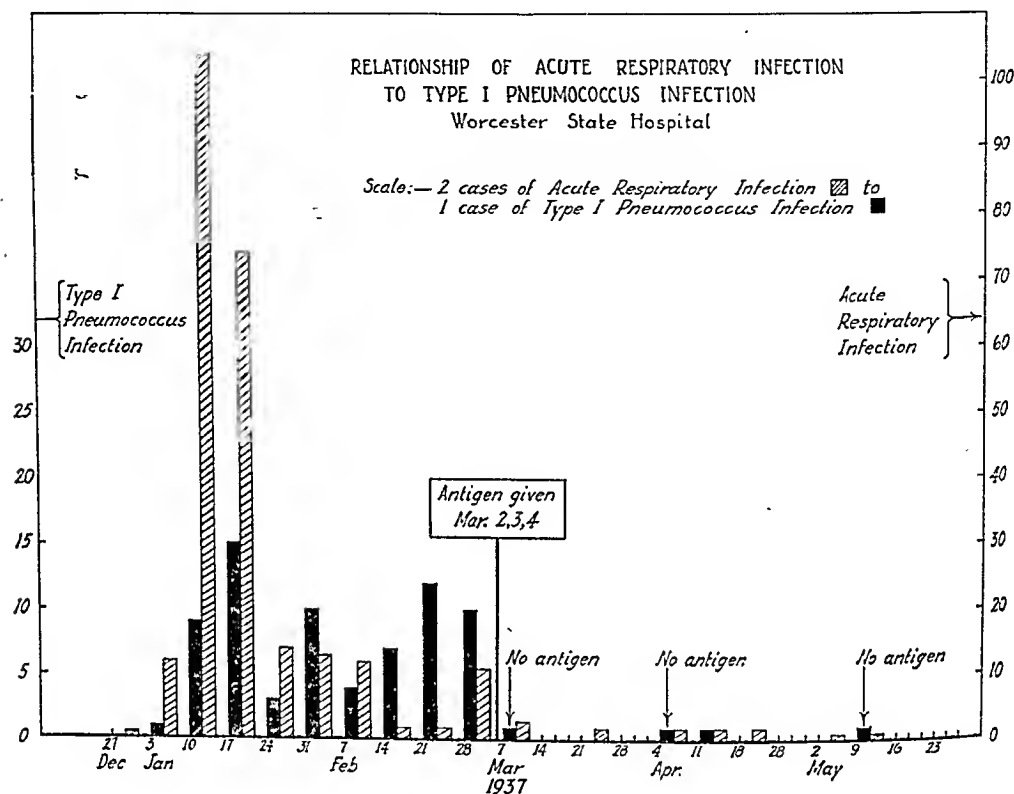
The institution has approximately equal numbers of male and female patients. The male and female patients are segregated in separate wards, and are classified in accordance with their mental condition. Each side of the Main Hospital has an infirmary, one for males, one for females, for the treatment of acutely ill patients. All patients who develop pneumonia or other acute illness on the general wards, and also in Summer Street Division, are transferred immediately to the infirmary for special medical or surgical treatment. All responsibility for the medical and surgical care of the acutely ill patients is centered in one staff physician.†

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

† We wish to express our appreciation of the fine cooperation and aid that was given to us by all members of the hospital staff, and particularly by Dr. F. H. Sleeper, Assistant Superintendent of the Hospital, and by Dr. W. E. Glass, staff physician in charge of acutely ill patients.

CHART I

Chart I shows the relationship of the epidemic of Type I lobar pneumonia at the Worcester State Hospital to the epidemic of influenza. Type I pneumococcus infection prevailed from the very first of January, and increased as influenza increased. The influenza outbreak was over by the middle of February, but Type I pneumonia did not decline until Type I pneumococcus antigen was given on March 2.



Bronchopneumonia has been quite prevalent among the patients of the hospital, as is always the case in institutions for mental diseases. Lobar pneumonia, however, has shown only a slightly higher incidence among the patients and staff of the hospital than in the population of the state at large.

The average annual incidence of pneumonia in the hospital during the past 4 years, including terminal bronchopneumonia, has been as follows: bronchopneumonia, 70.5 cases, 48 deaths; lobar pneumonia, 18.0 cases, 8 deaths.

Pneumonia of both types has been more prevalent in the male than in

the female patients of the hospital. The sex ratio of pneumonia incidence in these patients has been about the same as that of the general population.

	Males	Females
Proportion of Cases of Bronchopneumonia in the Institution	55%	45%
Proportion of Cases of Lobar Pneumonia in the Institution	64%	36%

As a general rule, bronchopneumonia has prevailed throughout the year, but lobar pneumonia has been much more prevalent during the late winter and early spring months than in the summer and fall.

THE INFLUENZA EPIDEMIC

Beginning early in January, 1937, an epidemic of moderately severe upper respiratory infection invaded the Main Hospital. This outbreak was similar in all respects to an epidemic of acute respiratory infection that prevailed at the same time along the whole North Atlantic Coast. Though many of the cases of this illness, both in and outside the hospital, were relatively mild, nevertheless it seems quite probable that the outbreak was true epidemic influenza.* The course of this influenza outbreak in the Main Hospital is indicated on Chart I.

Summer Street Division, although only 3 miles from the Main Hospital, escaped the influenza outbreak.

The hospital routine was completely upset by the epidemic. It was necessary to set aside certain special isolation wards for care of the acutely sick. The disease spread with rapidity throughout the institution. The peak was reached in the week of January 10, during which 96 cases occurred.

The hospital physicians noted that an unusual number of cases of pneumonia accompanied the influenza outbreak, but at first this fact caused no special concern.

The epidemic of influenza in the Main Hospital followed a characteristic incidence curve, and at the end of 6 weeks, conditions in the hospital had returned almost to normal. However, it soon became apparent that pneumonia was continuing long after the influenza epidemic had terminated. Instead of a concomitant decline in pneumonia with the decline in the incidence of influenza, as had been anticipated, lobar pneumonia continued unabated (see Chart I).

The hospital authorities noted that most of these cases of pneumonia were due to the Type I pneumococcus. They noted also that the onset of the attacks of pneumonia in those cases that occurred in the latter part of February was sudden, without a history of recent acute upper respiratory infection.

THE PNEUMONIA EPIDEMIC

On February 25, we were invited, in our capacity as State Consulting Epidemiologist, to aid in an investigation of the pneumonia situation at the Main Hospital.

A rapid survey revealed the following facts:

1. The epidemic of acute upper respiratory infection (influenza) at the Main Hospital, which began the week of January 3, had terminated, with no invasion of Summer Street Division.

2. Cases of lobar pneumonia were developing at a rapid rate in the Main Hospital. The infirmary was full of them, and new cases were coming in every day.

3. The cases of pneumonia were coming from many different parts of the hospital. The outbreak was not limited to one ward, to one occupational section such as farm hands and outdoor workers, or any single type of patient. Physicians, nurses, and attendants were affected as well as patients.

4. Practically every case of lobar pneumonia was due to the Type I pneumococcus.

5. The pneumonia outbreak was limited to the Main Hospital, and had not invaded the Summer Street Division.

6. There was no unusual prevalence of Type I pneumococcus pneumonia in the city of Worcester, nor in the State of Massachusetts as a whole.

In view of our previous experience with the Type II pneumonia epidemic at Bedford Hospital,¹ we felt quite certain that these findings indicated very strongly that the Type I pneumococcus had become widely distributed and had established itself in all parts of the institution. The source of the infection of the patients was not a single heavily infected individual

* The virus of epidemic influenza was obtained many times in our own and other laboratories by ferret inoculation of material obtained from victims of this epidemic.

(case or carrier) who transmitted the disease through a common vehicle such as food. Carriers must have become highly prevalent throughout the Main Hospital, and these disseminated Type I pneumococci among their fellow patients and the attendants.

A random sample of Type I carrier prevalence in the Main Hospital was made at once. We employed the same technic in detection of carriers that we have used in previous studies.² Our surmise was verified almost immediately. The survey indicated that at least 10 per cent of the patients of the Main Hospital harbored the Type I pneumococcus in the nasopharynx. This is a great contrast with a normal population, where Type I pneumococcus is found in the nasopharynx only once³ or twice in 500 cultures.

The hospital authorities were faced with a serious emergency. They were responsible for a large population of presumably highly susceptible persons who were continuously exposed to a virulent pneumococcus; for it was certain that Type I pneumococcus was widely dispersed throughout the hospital. The month of highest pneumonia prevalence in New England was at hand. New cases of Type I lobar pneumonia were developing every day. The rapid detection and isolation of all the Type I pneumococcus carriers in the Main Hospital was an impossible task, for there were 200 of them at least.

In the face of this situation we determined to make an attempt to check further spread of the epidemic of pneumonia by a rapid immunization of the hospital population.

The antigen* used was a preparation of an antigenically active polysaccharide of the pneumococcus, a compound similar to that described originally by

Schiemann and Casper⁴ in 1927 and more recently by Avery and Goebel⁵ under the name of acetyl polysaccharide. However, the sample had properties more nearly like the polysaccharide studied by Felton⁶ in that it was practically devoid of acetyl groups and yet was fully antigenic. The analysis of this antigen, made by Felton, was as follows:

Nitrogen—per cent	3.16%
Glucose number	25.1 %
Acetyl	1.0 %
Precipitin titer	1:2,500,000
Type I immunity in mice	1:50,000,000

In addition, Felton⁷ had tested the antigen on human beings and found that a single injection of 2 mg. stimulated antibody production effectively. The obvious advantages of an antigen of this kind are: it is soluble, stable, readily rendered sterile, and easily standardized to insure a satisfactory antigenic dose. We selected the Felton antigen for the above reasons, and also because of the fact that the antigen was immediately available.

The antigen was given subcutaneously in a single dose of 0.5 c.c. (2 mg.) to each adult. Over 1900 patients and attendants in the Main Hospital were injected on March 2, 3, and 4. No ill effects were produced.

The epidemic of pneumonia in the Main Hospital stopped almost immediately following the administration of the antigen. We cannot affirm, of course, that the antigen stopped the outbreak. It is possible that the epidemic might have stopped spontaneously on March 4. The results would have been much more clear-cut if it had been feasible for us to immunize every alternate person, but this was not possible. The hospital authorities felt that if we had any reason to believe that the antigen would give some protection, then we were unjustified in withholding this possible protection from a single patient. A small num-

* This antigen was kindly furnished to us by Dr. Malcolm of the Lederle Laboratories.

ber—about 200—of the patients and a few attendants refused the antigen, and this group served, in some degree, as a control series.

The course of the epidemic is shown graphically in Chart 2. The striking feature is that the pneumonia ceased abruptly following the administration of the antigen. Eighty-four cases of lobar pneumonia had occurred in the Main Hospital between January 3 and March 3. Nine cases of lobar pneumonia occurred after the antigen was given (from March 4 to June 1), only 4 of which were due to the Type I pneumococcus. Three of these had not received the antigen. One patient,

I. L., female, 78 years old, who had been given the antigen on March 31 developed lobar pneumonia on April 18 and died in 4 days. This case represents a definite failure of the antigen to protect against Type I pneumococcus invasion. Four of the other patients who developed lobar pneumonia (March 4 to June 1) had been given the antigen, but their pneumonias were due to some other organisms than the Type I pneumococcus.

Nine individuals were discovered who had a respiratory tract infection in which Type I pneumococcus was the prevailing organism, yet they never developed typical lobar pneumonia.

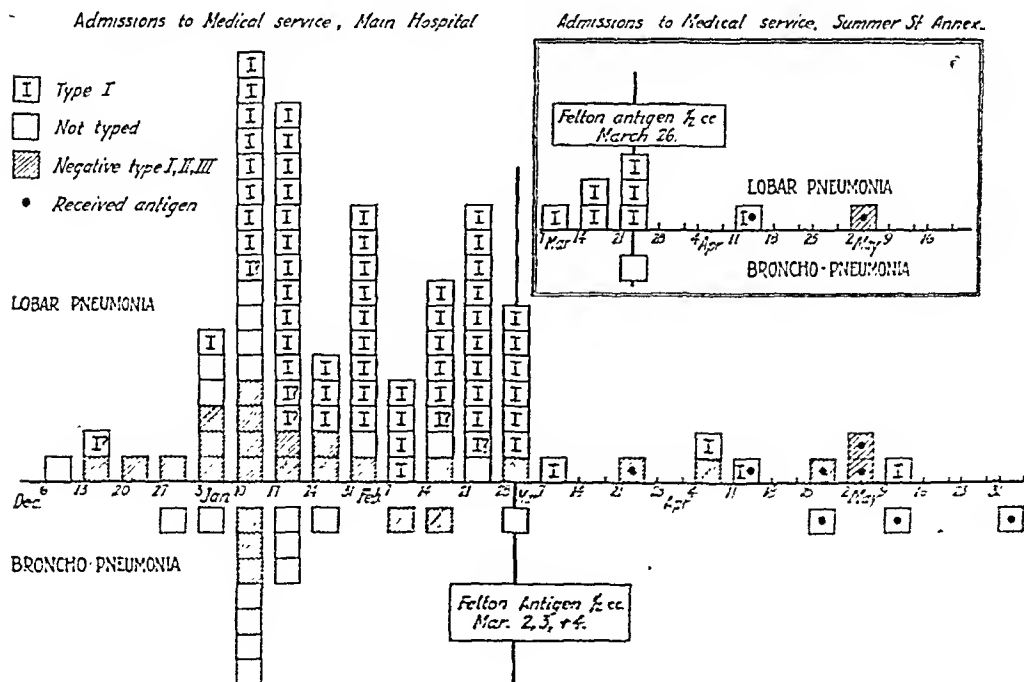
CHART 2

Graph of the Course of the Epidemic of Type I Lobar Pneumonia at Worcester State Hospital.

Each square represents a case of pneumonia. Bronchopneumonia cases are shown below the base line—lobar pneumonia above. Each case of proven Type I pneumonia is indicated by a [I] in the square. If the individual had received antigen, it is indicated by a dot within the square.

The small diagram inserted in the upper right hand corner represents the Summer Street Division outbreak which occurred after the Main Hospital epidemic had stopped.

WORCESTER STATE HOSPITAL



Three of this group were diagnosed clinically as cases of influenza, and 5 as common colds. One had an otitis media, followed by a fatal attack of Type I pneumococcus meningitis.

Case P. D.—Only one in this latter group (P. D.) had been given the antigen on March 3. He came to the infirmary on the evening of March 6 with a temperature of 104° F., pulse 120, and respirations 20 per minute. His leucocyte count was 16,000 per c.mm. and he gave every evidence of a beginning lobar pneumonia. The X-ray report next morning read "questionable early lobar pneumonia." His temperature fell by crisis on March 8. He was quite well on March 9. His sputum on March 7 was positive for Type I pneumococcus. He may be said to have run a complete course of pneumonia in 4 days.

It seems possible that the antigen which was administered 3 days previous to the onset of his illness may have given this patient some degree of protection against Type I pneumococcus invasion.

THE SUMMER STREET DIVISION PNEUMONIA OUTBREAK

The Summer Street Division, 3 miles from the Main Hospital, escaped the epidemic of influenza in January. At the time we began our investigation on February 28, no cases of Type I lobar pneumonia had occurred there.

The first case of Type I lobar pneumonia developed at Summer Street on March 9, nearly a week after the Main Hospital epidemic had ceased. This first patient was a newly appointed attendant, who had had no contacts with the patients of the Main Hospital. In view of these facts we should have been on the alert, and should have made an immediate investigation of Summer Street to determine the prevalence of Type I pneumococcus carriers there, and also to find the source of infection of this first case, but we did not do so.

Beginning on March 19, 5 cases of

Type I lobar pneumonia developed in quick succession among the male patients in the Summer Street Division. A fresh supply of antigen was obtained and all the patients and attendants were given a single subcutaneous injection of this antigen on March 26.

The outbreak of pneumonia at Summer Street Division ceased, following the administration of the antigen, just as it had done at the Main Hospital. The course of this outbreak is shown in the insert of Chart 2.

Cases—It will be noted that 2 cases of lobar pneumonia occurred in Summer Street, after the antigen was given. One of these represents a failure of the antigen to protect against Type I pneumococcus invasion. This individual, M. C., 63 years old, was given the antigen on March 26, developed Type I lobar pneumonia on April 17, and died in 4 days. The second pneumonia victim also had the antigen on March 26, but his pneumonia, which developed on May 2, was due to Type IV pneumococcus.

How can one explain the invasion of Summer Street Division by Type I pneumococcus after the epidemic in the Main Hospital had ceased? It seems most probable that the infection was introduced by carriers that were transferred to Summer Street from the infected zone.

Thirty persons had been transferred to Summer Street Division from the Main Hospital between January 1 and April 1. In Table I we have given the dates of transfer of these individuals.

Cultural studies of the nasopharynx of each of the entire group of transfer patients were made on March 29. Two, a woman transferred on March 1 and a man transferred on March 29, were found positive for Type I pneumococcus. The woman could not have been the direct source of the infection of the Summer Street cases of lobar pneumonia, because all the pneumonia cases had come from the male wards. The man was not responsible, because the infection had been introduced be-

TABLE I

Table of Transfer of Patients from the Main Hospital to the Summer Street Division from January 1 to April 1, 1937

<i>Date</i>	<i>Number of Men</i>	<i>Number of Women</i>	<i>Remarks</i>
January—1st week	4	1	No further transfers in January because of influenza epidemic at Main Hospital.
February 1	3	1	
" 17	3	0	
" 19	4	0	One man, J. F., was convalescent from lobar pneumonia, which he had developed Jan. 14. Type I pneumococcus was never found in his sputum.
" 24	0	1	
March 1	0	2	One woman, L. W., was found to be Type I carrier on March 29.
" 3	1	0	
" 5	0	1	
" 8	2	0	
1st case of Type I pneumonia developed.			
March 25	4	0	
" 29	3	0	One man, M. D., was found to be a Type I carrier on March 29.

fore he arrived, probably between February 15 and March 1. (See Chart 2). It seems quite possible that patient J. F. (see Table I), who developed lobar pneumonia in the Main Hospital on January 14, and who was transferred to Summer Street on February 19, was the source of infection. We know that the new cases originated in the ward to which he was sent, and the outbreak began shortly after his arrival. The chain of evidence is not complete, however, since the throat culture of J. F. was negative on March 29, the date that the Summer Street carrier studies were first made.

We can be fairly certain that Type I pneumococcus was transferred from the Main Hospital to the male wards of Summer Street Division late in February. The infection spread through the male wards, but not the female wards. Subsequent events showed that both carriers and cases of Type I pneumococcus infection were produced following the introduction of the specific organism.

STUDIES OF TYPE I PNEUMOCOCCUS CARRIERS

When we began our study on February 27, the epidemiological evidence suggested that Type I pneumococcus carriers were widely distributed throughout the Main Hospital. Our first step was to take a random sample of cultures from the nasopharynges of patients and attendants from the various wards. We found almost at once that our surmise was correct.

The search for carriers was continued after the antigen had been given, and after the epidemic of pneumonia had ceased. A total of 280 different persons were tested in order to secure an estimate of the prevalence of Type I pneumococcus carriers in the hospital population. Twenty-two normal individuals were discovered to be harboring virulent Type I pneumococci—a carrier rate of 7.8 per cent—or 35 times the normal carrier rate of the general population. Sixteen of these normal carriers were found in the Main Hospital and 6 in Summer Street, most of them during the first month of the

study. The duration of the carrier state in each person is shown in Chart 3. It will be noted that most of the carriers cleared up spontaneously within a short time. By June 7 all but 5 had become negative.

Case—Only one discovered carrier later developed lobar pneumonia. L. R.—41 years old, male, Summer Street Division—was found to be a nasopharyngeal carrier on March 24. He was given 0.5 c.c. antigen on March 26. Some 650 other patients and attendants at Summer Street were inoculated on the same day. Twenty-four hours later he suddenly developed Type I lobar pneumonia.

It is possible that the antigen may have precipitated the attack of lobar pneumonia in this individual. However, 4 other patients at Summer Street were also known to be carriers, and were injected with antigen at the

same time as L. R., but without ill effect.

DISCUSSION

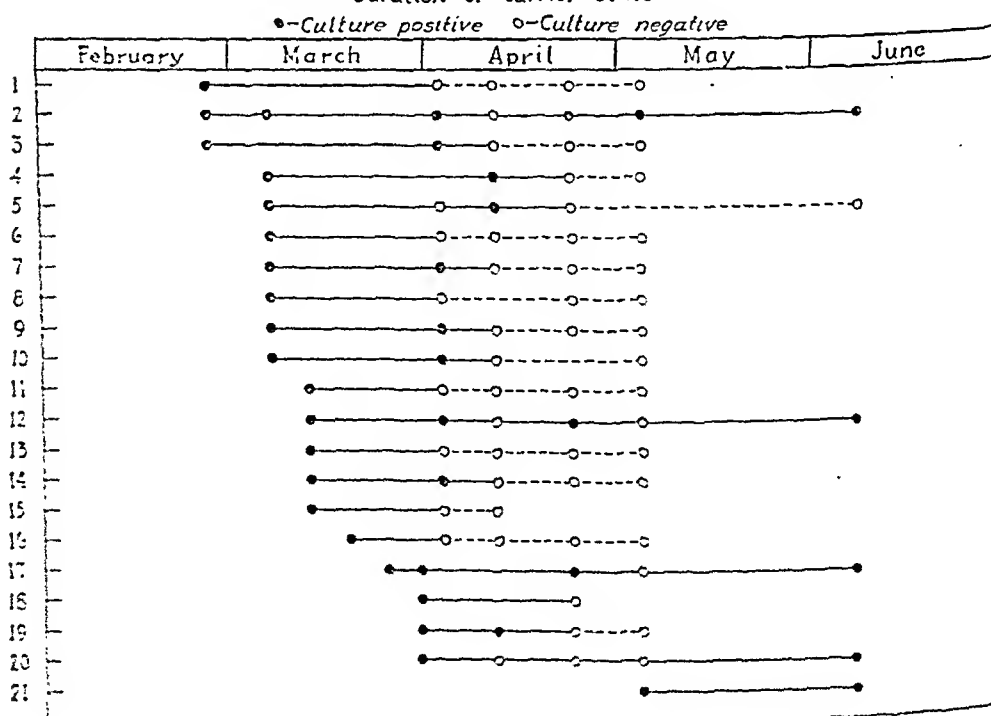
The epidemic of lobar pneumonia at the Worcester State Hospital was very extensive and serious in its effects. Between December and May, 110 cases of lobar pneumonia occurred, most of them in January and February.

The fatality rate of the epidemic was high, despite extensive use of Type I anti-pneumococcus serum. Many of the patients were debilitated and noncoöperative. The group in which no pneumococcus type was determined had a particularly high death rate (see Table II). These persons were extremely noncoöperative, and no sputum could be obtained from them. Often the type of infection was not determined

CHART III

The graph illustrates the duration of the carrier state in the 21 Type I pneumonia carriers that were discovered at Worcester State Hospital.

TYPE I PNEUMOCOCCUS CARRIERS Duration of Carrier State



because of the rapid progress and fatal outcome of the disease. It is probable that most of them were infected with Type I pneumococcus.

Sixty-seven pneumonia patients had a positive Type I pneumococcus sputum. It seems probable that most of the remaining 43 cases of the series of lobar pneumonia were also caused by Type I pneumococcus, but this point is difficult of proof. We made an attempt to do so.

TABLE II

Mortality Rates from Lobar Pneumonia in the Epidemic at the State Hospital in Worcester, Mass., 1937

<i>Lobar Pneumonia</i>	<i>Cases</i>	<i>Deaths</i>	<i>Mortality</i>
			<i>Rate</i>
Type I	73	16	22%
Not Type I, II or III	25	7	28%
Not typed	12	6	50%
Total	110	29	26%

When we began our study, many of the untyped patients were dead. We secured a list of all the convalescent pneumonia patients in whom Type I pneumococcus had not been found, and obtained blood from each of them. They were tested for the presence of Type I specific immune bodies, using standard methods.⁸ The bloods of 17 out of a group of 21 that were tested showed a protective power of 100 m.l.d. in standard mouse protection tests. The blood of 6 of these persons agglutinated the Type I pneumococcus in dilution of at least 1-5, and showed a mouse protection test of at least 1,000 m.l.d. We have felt justified in including these 6 persons in the list of those who undoubtedly had Type I pneumococcus pneumonia. They are indicated in Chart 2 as [I?]. We feel quite sure that all 17 convalescents that showed a blood protection power of 100 m.l.d., and many more of the group of lobar pneumonia patients as well, had also been infected

with the Type I pneumococcus, but we have no conclusive proof.

In addition to the actual cases of Type I lobar pneumonia, there were discovered 9 persons who were infected with Type I pneumococcus who never developed typical lobar pneumonia. We can make a fair estimate, therefore, that the total toll of the epidemic was at least 80 to 100 cases of Type I lobar pneumonia, together with at least 9 Type I pneumococcus infections that were not lobar pneumonia.

A cross-section of carrier prevalence indicated that there were at least 200 carriers of Type I pneumococcus in the institution during the epidemic; probably there were many more. As the pneumonia season ended, these carriers cleared up so that it is quite probable that by June 1, not more than 50 carriers remained. Most of these carriers would become negative before the summer was over.

The antigen was given in each hospital division at a time of high pneumonia prevalence. Practically all the carriers were given antigen, but there is no evidence that this procedure affected their carrier state. There is strongly suggestive evidence, however, that the administration of antigen at the Main Hospital checked the further spread of Type I lobar pneumonia in that institution. The disease then spread to Summer Street Division, after it had receded in the Main Hospital. The sudden abatement of lobar pneumonia at the Summer Street Division, following administration of the antigen was striking. The picture here was quite different from that at the Main Hospital. It might be claimed that the pneumonia epidemic at the Main Hospital had run its course when we began our study, and would have stopped on March 4 without any interference on our part.

The same argument cannot be em-

ployed at Summer Street. Conditions were ideal there for the spread of the infection. There were 600 patients and 100 employees. Presumably these persons were as susceptible to pneumonia as had been the group at the Main Hospital. The virulent infection had been introduced recently from the Main Hospital, and carriers became widely established. The cases began to develop rapidly in March, and stopped abruptly following universal administration of antigen.

If a single injection of 0.5 c.c. Type I pneumococcus antigen will protect susceptible individuals from an attack of Type I lobar pneumonia in the face of a heavy exposure and under conditions that are highly favorable for the spread of this infection, then this is a matter of far-reaching significance and worthy of continued study.

CONCLUSIONS

1. An extensive epidemic of lobar pneumonia in 1937 at the State Hospital in Worcester, Mass., which began during an influenza outbreak, was due to the Type I pneumococcus.

2. Type I pneumococcus carriers became widely distributed throughout the Main Hospital. These carriers, and not the actual cases of pneumonia, were responsible for the spread of the infection.

3. The epidemic at the Main Hospital ceased abruptly following administration of Type I soluble antigenic substance (Felton antigen) to the hospital population.

4. A fresh outbreak of Type I lobar pneumonia occurred at Summer Street Division (a branch hospital) 1 week after the epidemic at the Main Hospital abated. This infection entered Summer Street Division through normal carriers of Type I pneumococcus, who were transferred from the Main Hospital to the subsidiary hospital. The administration of antigen at Summer Street was also followed by immediate cessation of this outbreak.

REFERENCES

1. Smillie, W. G. Study of an Outbreak of Type II Pneumococcus Pneumonia at the Veteran's Hospital at Bedford, Massachusetts. *Am. J. Hyg.*, 24:522, 1936.
2. Smillie, W. G. The Epidemiology of Lobar Pneumonia. *J.A.M.A.*, 101:1281, 1933.
3. *Ibid.*
4. Schiemann, O., und Casper, W. Sind die spezifisch präcipitablen Substanzen der 3 Pneumokokkentyphen Haptene? *Ztschr. f. Hyg. u. Infektionskrankh.*, 108:220, 1927.
5. Avery, Oswald T., and Goebel, Walther F. Chemo-immunological Studies on the Soluble Specific Substance of Pneumococcus. I. The Isolation and Properties of the Acetyl Polysaccharide of Pneumococcus Type I. *J. Exper. Med.*, 58:731, 1933.
6. Felton, Lloyd D.* Studies on the Immunizing Substance in Pneumonia. *J. Immunol.*, 27:379, 1934.
7. Felton, Lloyd D., Sutliff, W. D., and Steele, B. F. Antigenic Characteristics in Man of Certain Products of the Pneumococcus. *J. Infect. Dis.*, 56, 101, 1935.
8. Finland, M., and Sutliff, W. D. Immunity Reactions of Human Subjects to Strains of Pneumococci Other Than Types I, II, and III. *J. Exper. Med.*, 57:95, 1933.

* Also see previous and subsequent papers in the *Journal of Immunology* and elsewhere upon this subject by Dr. Felton.

Contact

MY last word is this. Every person who contacts the public in any health organization, no matter what it may be, has some effect on public relations. If you have somebody at the telephone desk, or somebody in the reception bureau, whose attitude is gruff or sharp, he can do more harm than the head of the organization can undo. When we turn the public away with an uncivil answer, we create bad

public relations. There really ought to be a training course, however brief, in every organization employing a large personnel in the public health field, to teach their staff how to meet the public, what to say to them, and how to say it. Those who can't learn the knack should be placed where they do not deal with their clientele.—*The Health Officer*, January, 1938, page 435.

The Health Department in the Field of Medicine*

R. H. RILEY, M.D., DR.P.H., F.A.P.H.A.

Director, Maryland State Department of Health, Baltimore, Md.

FOR the purpose of this discussion, "the field of medicine" is here defined to include all activities of the scientific staff of the health department who are primarily concerned with the diagnosis, treatment, and prevention of remediable physical conditions.

In considering how dependent curative medicine is on preventive medicine, it is very difficult to determine where one ends and the other begins. It is doubtful if any phase of curative medicine is complete without due regard to prevention, even though it may be only the immunization of contacts against a communicable disease or the necessary advice to ward off complications or sequelae of acute infectious diseases.

There has been a remarkable expansion of public social services during recent years. These developments reflect the growing sense of responsibility of the community for the health and well-being of the individual members of it. The ordinary citizen today is not only to have a better chance of coming into the world in good health, but must be given every opportunity of making the best of his life before he leaves it.

The fruits of this philosophy are seen in the maternity and child welfare

services, educational reforms, preventive and curative health services, slum clearances and in programs for improved housing.

Highly organized federal, state, and local health departments exist which are responsible for the control of communicable diseases and for sanitation. The medical profession works no longer as independent individuals in the field of public health, but perforce as team mates with health departments and through such teamwork results may be accomplished which could not be obtained by individual action.

The medical activities of the Maryland State Department of Health are considered below under headings arbitrarily chosen to follow the activities of the several bureaus and divisions of the department.

Field of Communicable Diseases— In Maryland there is a full-time trained medical officer of health in each county. All services rendered from the central office are conducted through the county health units and include diagnostic aid, epidemiological investigations, preventive inoculation programs, laboratory services, and assistance required to protect water, milk and food supplies.

With regard to the control of certain diseases such as tuberculosis, syphilis, gonorrhea, and poliomyelitis, the health department provides not

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

only diagnostic and therapeutic services, but assists in hospitalization. The responsibility for hospitalization and other special types of cure is not predominantly under the health department.

(a) *Tuberculosis*—In addition to the general diagnostic activities provided by the health department, mainly in the forms of tuberculosis clinics, the state also makes provision for the hospitalization of cases in the 4 state tuberculosis hospitals. Three of the local health officers conduct clinics; the other clinics are conducted by staff members of the State Tuberculosis Sanatoria. Provision is also made for the epidemiological investigation of all reported cases, follow-up services with bedside nursing care in some instances, the tuberculin testing of selected groups of individuals, and for X-ray examinations, free of charge, for all cases recommended by the clinician or health officer conducting the tuberculosis clinic or having charge of individual cases of tuberculosis. Portable X-ray machines are now provided by the state which make it possible to have such examinations at even the most isolated clinics.

In our tuberculosis work in Maryland, to maintain the cordial coöperation of the family physician, the clinician conducting the tuberculosis clinics refers all reports and recommendations directly to the family physician and not to the patient. The physician depends largely on the Health Department to facilitate early hospitalization of tuberculosis patients and coöperates fully in the epidemiological investigation of cases and is of great service in instructing the families in preventive measures.

(b) *Syphilis*—The Maryland State Department of Health conducts a diagnostic service through its laboratories which perform serologic tests for syphilis, without charge. The Balti-

more City Health Department Laboratory also extends this same service to the physicians practising in Baltimore City. At the syphilis clinics, blood specimens are taken from all patients attending, and the health officer also takes blood specimens from private patients who may be referred by private physicians. Darkfield examinations are made at some of the clinics and in the central laboratory when specimens are forwarded either by the health officer or private physicians. Reports are sent directly to the physician in charge of the case and in no instances are reports sent direct to patients. These diagnostic aids are available for all types of syphilis and gonorrhea, and physicians use the service freely.

We are having a favorable response to our request to the hospitals to make the Wassermann test a routine diagnostic procedure for all admissions. We feel that if this request falls short of its complete goal, if we obtain the test on all maternity cases, we will have made considerable advance. In all of our prenatal clinics held throughout the state, the Wassermann test is a routine procedure and all patients giving a positive reaction are urged to take treatment either from their private physicians or at a clinic.

In our present program in Maryland we have 50 clinics, 40 in the counties, and 10 in Baltimore City, conducted by local health officers in some instances or by selected clinicians who are paid for their services by the state and city. The Department of Health provides neoarsphenamine and preparations of bismuth or mercury for treatment in accordance with modern therapeutic methods. These drugs are supplied without distinction as to the patient's ability to pay the physician a full fee or any fee for the service. This method makes it possible for private physicians to provide medical care to

many patients who cannot afford to pay for medical services.

The services of the county health officers and public health nurses are available to follow up lax cases of the private physician when requested to do so. This is an important feature since only by sufficiently sustained treatment can syphilis be rendered non-infectious and in a number of cases clinical cure procured. A few physicians in their regular practice are doing excellent case finding work with their patients. In an epidemiological investigation the important question is, "From whom did the patient acquire the disease and to whom may he or she have transmitted it?" Early syphilis, syphilis in pregnancy, and congenital syphilis offer the best field for epidemiological investigation. In Maryland a complete case history is obtained from all patients attending the clinic, and the local health officer and his staff of nurses begin their epidemiological investigation from that point.

The State Department of Health furnishes consultation service which has made it possible for local health officers, clinicians, and private physicians to have the benefit of expert advice on the diagnosis of syphilis, especially its late manifestations, and to have outlined for them an approved method of treatment.

We have been able, with the assistance of the consultant on venereal disease, to direct particular attention to the early detection and treatment of neurosyphilis and cardiovascular syphilis, the two types which cause the greatest economic loss from incapacity and early death. In all cases giving a positive Wassermann reaction, treatment is given for 9 months before spinal fluid tests are done. By this procedure we find potential cases of general paralysis of the insane and prevent their becoming a total liability in so far as the state is concerned.

The Baltimore City Health Department has a Bureau of Venereal Disease under the supervision of a full-time director. The city conducts clinics and maintains close contact with out-patient departments conducted by the several hospitals in Baltimore City. A complete follow-up service is provided and all activities are conducted in close coöperation with the practising physicians of Baltimore City.

Our general plan of treatment of all syphilitic cases conforms to the standard plan as submitted by Dr. Parran's committee. We are also meeting no small degree of success in the treatment of syphilis in infants, and in Baltimore City there are several clinics just for congenital cases.

(c) *Pneumonia*—A number of health departments have recently embarked upon an extensive pneumonia control program which includes not only greatly extended diagnostic facilities, but in some states the manufacture and distribution of therapeutic sera for the more common types: *viz.*, type I and type II.

In Maryland, laboratory diagnostic assistance has been extended to all physicians and the demand for this service has steadily increased. On the request of the attending physician, the sera available for the treatment of the disease are furnished at cost.

(d) *Preventive Inoculations*—Diphtheria toxoid administration in Maryland is carried out almost entirely by the local health officer and his staff. Pre-Schick testing is not a routine procedure in the state program, but in several counties where special studies have been conducted, the Schick test has been made previous to inoculations with toxoid.

Post-Schicks are done on the great majority of persons who have received diphtheria toxoid. It has been estimated that 75 or 80 per cent of the school children have received diphtheria

toxoid, and the percentage of preschool children receiving diphtheria toxoid has increased each year. Health departments have a definitely fixed legal responsibility in the control of communicable diseases of which preventive inoculations is only one. I believe that when the family physician recognizes his responsibility to inoculate all children under 1 year of age in his clientele, the work of the health department in this field will gradually become less and less.

In several of the counties the toxoid administration has been carried out largely by the practising physicians, the State Department of Health supplying the toxoid in return for which the physician furnishes the local health department with certain statistics pertaining to the number of injections given. Diphtheria antitoxin is furnished free to physicians for use for private as well as for indigent patients.

Antirabic treatment is furnished free of charge to all patients and is given to those living in Baltimore by a physician on the staff of the State Health Department. Indigent patients living in the counties receive treatment at the local health department.

(e) *Services for Crippled Children*—The care of physically handicapped children includes: case finding of poliomyelitis reported by private physicians and health officers, and of other physically handicapped children referred by the school board through its school survey for crippled children, local health officers, social welfare workers, and private physicians; the organization and supervision of clinics conducted by orthopedic surgeons paid on a per diem basis by the State Department of Health.

The orthopedic surgeons examine patients, make recommendation for hospitalization, surgical care in hospitals, and give definite instruction to the physiotherapists for after-care in the

home, and reëducation of affected muscles.

In coöperation with the Board of Education handicapped children are provided for in special classes, and with home and bedside teaching, and rehabilitation. The orthopedic surgeon is in full charge of all patients attending his clinic from date of examination to final discharge of the patient.

(f) *Laboratories and Research*—In addition to the laboratory diagnostic activities, the central laboratory of the Maryland State Department of Health and, to a more limited extent, the branch laboratories conduct medical and technical research in fields which are intimately related to the practice of medicine, with particular emphasis on immunology and serology. Professional members of the staff of the laboratories are available for special assignments to assist county health officers in field investigations and consultations with physicians with regard to the diagnosis and prevention of communicable diseases and the protection of public water supplies. In Baltimore, the City Health Department conducts similar laboratory services, and in addition has an active research program at Sydenham Hospital.

(g) *Maternity, Infancy and Child Hygiene*—The field of maternal and infant hygiene includes to an increasing degree the provision of consultant and technical services. The state has for a number of years conducted itinerant maternal and child health services designed to assist local health officers and private physicians in the maintenance of a high standard of maternal and infant care.

A nurse instructor with special knowledge of maternal and child hygiene has been assigned to some of the counties to devote most of her time instructing nurses and midwives in the technic of this phase of work. Three nurses with obstetrical training and experience have

been employed for this service. The obstetrical nurses deliver selected indigent cases and supervise the work of the midwife. The service has been made available upon the request of the physician for assistance at the delivery in patients unable to provide nursing service for themselves. This service has been most favorably received by the local practitioners.

(h) *School Examinations* — Here again the sympathy and support of the general practitioner is most important if it can be obtained. In a number of communities, where the private practitioner, at the request of the county health officer, has conducted the school examinations they have found this to be a more satisfactory arrangement. The examinations include physical examination of the chest, nose and throat, sight, and hearing. Correction of defects found at school examinations is made at one of the local hospitals, and the physician's fee and hospital charges are met by the local community. In school examinations it is impossible to avoid entering into "the field of medicine" for conditions such as scabies, impetigo, ringworm, and pediculosis. In the rural sections these conditions, if not treated by the members of the health departments will go untreated, as the majority occur among groups unable to afford the services of a physician and in many instances unable to purchase the necessary drugs. In Baltimore City in school work, the policy has long been to allow the family physician, if there is one, to have the last word.

Control of communicable diseases in the schools is a health department activity of major importance, and frequent inspections are made by the health officers in connection with other measures in carrying out this function.

(i) *Dental Clinics*—I do not know of any better organized piece of real health work than the dental clinics.

They are held in some localities where no dental facilities are available. Dentists are employed on a part-time basis in some localities and on a full-time basis in others. The clinics are free to those unable to pay, but some are on a self supporting basis, fees being raised by Parent-Teacher Associations and clubs to pay part of the dentists' salaries.

(j) *Field of Public Health Nursing* —We conduct a generalized public health nursing program in which primary emphasis is placed on public health educational and promotional activities. The nurses' activities also include services in the schools and certain specialized services including case finding, assistance and follow-up in connection with the operation of syphilis control clinics, prenatal, tuberculosis, and mental hygiene clinics, and other such functions which have a medical or therapeutic aspect as contrasted with the more restricted preventive measures.

(k) *Disaster Relief* —Disasters of almost any nature, either fire, flood, or earthquake, are invariably followed by problems which are entirely medical in nature aside from the physical accidental injuries. In communities where well organized health departments exist, the health department has been the center of activities and has generally been designated as headquarters for not only official organizations participating in relief, but for other national and local organizations who have always availed themselves of the opportunity to be associated with the health department in its relief program. In major disasters the health officer should inform the public as well as the physician where he may be reached by telephone and the location of the central and local distributing points.

(l) *Control of Typhoid Carriers* —In the field of preventive measures, the control of chronic typhoid carriers

presents a difficult problem. In some states, medical, surgical, nursing and institutional care may be provided by the state department of health at the expense of the state. We have been successful in a number of instances in inducing chronic typhoid carriers to undergo operations for the removal of the gall-bladder with a view to possible removal of carrier restrictions. This is usually not urged, especially for the older carriers. In the limited number of cases thus far so treated, the results have been most satisfactory and the surgeons have become keenly interested in this phase of work.

RELATIONS WITH THE STATE MEDICAL SOCIETY

All programs pertaining to the practice of medicine, either curative or preventive, are discussed with the Council of the Medical and Chirurgical Faculty—the State Medical Society—which acts as a Committee on Public Health, and through this committee the voice of the private practitioner is heard and his interest and coöperation are thus maintained.

We have not attempted any program in "the field of medicine" without first a full and frank discussion of the subject with the State and County Medical Societies. We have been fortunate in having our plans endorsed by the profession, and the Medical and Chirurgical Faculty has addressed letters to the physicians of the state calling their attention to subjects deserving their wholehearted attention in curative medicine as well as in preventive.

The coöperative support of physicians in Baltimore was shown when the

Baltimore City Medical Society on the recommendation of its own Committee on Public Health and Relations resolved,

... that the best interest of the community would be better subserved by the Baltimore City Medical Society requesting the City Health Department to put on a campaign on diphtheria immunization and that the physicians of the city coöperate with the Health Department to that end.

The physicians in Maryland have given freely of their time in assisting at clinics, conducting examinations, and administering biologics used as preventive measures, and we are constantly reminding the profession that such work as the eradication of diphtheria, the reduction of syphilis, and the adequate care of expectant mothers and young children must rest largely in the hands of the practising physician.

The cordial relations which exist between the state, city, and county health departments and the medical profession has eliminated many of the defects of earlier days. We believe that the results accomplished justify the means and at present, at least, there is no need to defend the efforts of the Maryland State Department of Health in "the field of medicine."

In the midst of our manifold perplexities, the progress we have made should hold encouragement for the future. We can say with Carlyle,

Doubtless this age is also advancing. Its very unrest, its ceaseless activity, its discontent contains matter of promise. Knowledge, education are opening the eyes of the humblest; are increasing the number of thinking minds without limit. This is as it should be; for not in turning back, not in resisting, but only in resolutely struggling forward, does our life consist.

The Dark Adaptation Test for Vitamin A Deficiency*

CARROLL E. PALMER, M.D., F.A.P.H.A. .

*Passed Assistant Surgeon, U. S. Public Health Service,
Washington, D. C.*

THE dark adaptation test for vitamin A deficiency is based on a common and familiar experience which consists essentially of the observation that in order to "see" in relative darkness the human eye must become accustomed or "adapted" to darkness. The physiological characteristics of this phenomenon, known as dark adaptation, have been extensively studied. Fundamentally the process is a photochemical reaction in which visual purple, the light sensitive pigment in the rods of the retina, is desensitized to dim light by exposure to bright light and is resensitized to dim light through regeneration in darkness.

It is a well established fact that moderately severe vitamin A deficiency is accompanied by an abnormality of the dark adaptation reaction, known as functional night blindness, which is manifested by an inability to see at night or in a dim light. Also, a direct chemical relation between vitamin A and visual purple has been proved. The precise physiological relation between vitamin A, visual purple, and rod function is not yet known; but it has been postulated that the amount of vitamin A in the body may

influence dark adaptation. Furthermore, although no satisfactory proof of a functional relationship between vitamin A and dark adaptation has been furnished, it seems not unlikely that mild degrees of vitamin A deficiency might be expected to result in delayed adaptation.

On the basis of these considerations a number of workers, particularly during the past few years, have investigated the measurement of vitamin A status by means of dark adaptation tests.

Using the Birch-Hirschfeld photometer, Jeans and Zentmire^{1,2} devised a test and applied it in a survey of Iowa school children. As a result of the study these investigators drew the striking conclusion that between 26 and 79 per cent of 404 children examined showed evidence of vitamin A deficiency. I. O. Park^{3,4,5} reported the test to be satisfactory for studies of adults and children and confirmed the impression of the comparative prevalence of vitamin A deficiency. Jeghers^{6,7} also used the test on adults and found mild to moderate degrees of vitamin A deficiency to be common among many supposedly healthy adults. However, Snelling⁸ concluded that the Birch-Hirschfeld photometer was unsatisfactory, both in adults and in

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

children, for measuring small differences in dark adaptation such as might accompany vitamin A deficiency.

A later paper by Jeans, Blanchard, and Zentmire⁹ included a description of a new instrument, the biophotometer, and an improved standardized technic for measuring dark adaptation. Reviewing their earlier survey findings in the light of results secured with the new method, these workers essentially confirmed their previous conclusions regarding the prevalence of vitamin A deficiency in children.*

In a very recent report, Palmer and Blumberg¹⁰ presented data, secured by the U. S. Public Health Service and based on a study of the biophotometer technic as a method for detecting mild vitamin A deficiency in the routine survey of school children. The material included the results of biophotometer tests of 585 children in the 3rd to the 8th grade of elementary schools in Maryland and the District of Columbia. In this study it was observed, as mentioned by Jeans, Blanchard, and Zentmire, that considerable improvement in readings, apparently due to a learning factor, resulted from repeated testing of the same children. Also, a great variation was found in successive tests of the same individual. These findings were interpreted as indicating that very little dependence could be placed on results based on a single test of a child. In addition to indicating these disturbing aspects of the test, it was pointed out that considerable uncertainty exists regarding proposed methods for classifying biophotometer measurements as representing different levels of vitamin A nutritional status. As a result, the conclusion was reached that the bio-

photometer technic does not yet appear to constitute a reliable method for detecting mild degrees of vitamin A deficiency in the routine survey of school children.

FEEDING STUDY

Some further data bearing on the problem of dark adaptation tests and vitamin A are now available from a special study carried out in conjunction with the U. S. Public Health Service surveys in Maryland. The character of this study was dictated primarily by the fact that nearly all of the evidence presented in the literature for considering the dark adaptation test to be an index of vitamin A status is based on improvements in adaptation measurements following the ingestion of the vitamin. However, no adequately controlled experiments have been reported in which changes in the dark adaptation reaction have been studied for comparable groups of individuals, one group being given vitamin A and the other group not being given the vitamin. In view of this the following experiment was undertaken.

Method—From among a group of approximately 450 3rd to 8th grade school children who had been given a biophotometer test in February and March, 1937, 106 were selected for special study. This selection was made on the basis of the results of the biophotometer test, the largest proportion of the children being those whose dark adaptation test marked as "deficient" in vitamin A, according to the criteria of Jeans, Blanchard, and Zentmire, a smaller proportion, those marked as "borderline subnormal," and a few marked as "normal." No children were included who had any evidence of ocular pathology as revealed by ophthalmoscopic examination. The children were separated, by random shuffling of their initial record cards,

* Jeghers¹¹ recently reported the results of a biophotometer study of 166 medical students, 35 per cent of whom showed photometric evidence of vitamin A deficiency.

into two groups, one to serve as a feeding series and the other as a control series.

As a preliminary to the feeding study, each child was given 3 biophotometer tests in addition to the initial test in order to obtain supplementary data regarding the reliability of the readings. Following this for 5 weeks each child was given a biophotometer test at weekly intervals, during which the children in the feeding group each received an average daily supplement of 18,000 International Units of vitamin A (equivalent to more than 8 teaspoonfuls of U.S.P. cod liver oil), or a total of 630,000 International Units in 5 weeks, in the form of halibut liver oil capsules.* The control series received daily supplements of 0.05 International Units of the vitamin in similar capsules. Parental permission was obtained to give vitamin A supplement to all of the children. It is obvious that the children receiving the supplement of 0.05 units of vitamin A per day constitute the control group. As an assurance that the dietary supplement was actually consumed, the capsules were given to the children at the school and were swallowed under the direct observation of an attendant. It may be stated also that none of the children or parents, and none of the persons actually making the biophotometer tests knew which was the feeding and which was the control series.

Results—The biophotometer test, as described by Jeans, Blanchard and Zentmire,⁹ and as employed in this study, consists of a series of visual threshold measurements or readings which are made following a standardized exposure of the subject's eyes to a bright light. The interpretation of

the test is assumed to depend on the form and position of the dark adaptation curve derived from the threshold measurements. According to the test procedure which has been proposed, however, it is presumed possible to judge the status of vitamin A nutrition from the values of threshold measurements made at two points on the adaptation curve. The more significant of these measurements is considered by Jeans, Blanchard, and Zentmire⁹ to be the reading made at about 25 seconds (20–30 seconds) following exposure to the bright light*; of lesser significance these workers consider the reading made at 10 minutes after dark adaptation begins. In accordance with this practice, therefore, the presentation of results of the study is limited to the data in Table I and Figure I. In the table the means and standard deviations † are given for both groups of children for readings made at 25 seconds and at 10 minutes after dark adaptation begins. The results of the

* It may be mentioned that a reading taken after only 25 seconds of dark adaptation probably measures the action of the cones of the retina, rather than that of the rods. Much is known of the relation between vitamin A and rod function, but no relation has ever been shown between vitamin A and the retinal cones.

† The threshold measurements used in this analysis are expressed as logarithms of millifoot candles of light intensities. Most workers, however, have used the absolute values of millifoot candles, and the criteria proposed by Jeans, Blanchard, and Zentmire⁹ for judging vitamin A deficiency have been expressed in such terms. Sufficient and sound reason, however, dictate the use of the logarithmic scale: First, the scale with which the biophotometer is equipped, and in which the readings are recorded, is a logarithmic scale of millifoot candle values expressed in arbitrary units. Second, the threshold measurements obtained in the dark adaptation test constitute a type of sensory measurement for which logarithmic scales have been proved in the past to be most satisfactory. Third, the practical utility of the logarithmic scale becomes apparent when frequency distributions of biophotometer measurements are made. Such distributions are very markedly skewed on the absolute millifoot candle scale, while they follow very satisfactorily the normal probability distribution on the logarithmic scale. Through the use of the logarithmic scale, therefore, it is possible to make use of those theoretical considerations which have been found applicable to the normal frequency curve.

* The vitamin A potency of the preparation was confirmed by assay, through the courtesy of Dr. E. M. Nelson, Chief, Vitamin Division, Food and Drug Administration, U. S. Department of Agriculture.

TABLE I

Means and Standard Deviations (Logarithms, Millifoot Candles) of 25 Second and 10 Minute Biophotometer Readings for an Experimental Group of 54 Children Given Vitamin A Supplement and a Control Group of 52 Children; All Children Given 4 Preliminary Tests Followed by Weekly Tests for 5 Weeks

Time During Adaptation When Reading Was Taken	Group of Children Tested	Preliminary Tests				Subsequent Weekly Tests					
		1st	2nd	3rd	4th	1st	2nd	3rd	4th	5th	
		Mean, biophotometer measurements (logarithms, millifoot candles)									
25 seconds	Vitamin A	+0.088	+0.009	-0.030	-0.072	-0.149	-0.194	-0.193	-0.245	-0.284	
(20-30 seconds)	Control	+0.025	-0.029	-0.058	-0.080	-0.122	-0.151	-0.151	-0.203	-0.313	
10 minutes	Vitamin A	-1.448	-1.601	-1.623	-1.706	-1.822	-1.810	-1.832	-1.791	-1.950	
	Control	-1.459	-1.540	-1.544	-1.600	-1.719	-1.669	-1.726	-1.659	-1.885	
Standard deviation, biophotometer measurements (logarithms, millifoot candles)											
25 seconds	Vitamin A	0.204	0.147	0.199	0.175	0.195	0.177	0.184	0.175	0.215	
(20-30 seconds)	Control	0.207	0.162	0.174	0.152	0.205	0.172	0.187	0.246	0.205	
10 minutes	Vitamin A	0.381	0.313	0.296	0.350	0.333	0.291	0.377	0.432	0.352	
	Control	0.367	0.312	0.317	0.367	0.340	0.350	0.400	0.436	0.430	

4 preliminary trial tests are given first, followed by the results of the weekly tests given after the supplementary feeding was begun. The data shown in the figure illustrate graphically the changes in the mean values of the threshold measurements for the successive tests. The ranges of the measurements are illustrated by lines representing two standard deviations above and below the mean values.

With regard to the general aspects of the results of the analysis, two striking facts may be noted: (1) it is evident that marked improvement in the averages of the threshold measurements occurs in successive tests in both the children fed the vitamin concentrates and in those not fed; (2) the measurements show a very high degree of variability as indicated by the ranges marked out by two standard deviations above and below the means.

Study of the data for the reading made at 25 seconds shows that the means of the first preliminary test for both the feeding and control groups fall into the range of values which are considered, by the criteria of Jeans and coworkers, to represent vitamin A deficiency. The average for the group that was subsequently given large doses

of vitamin A, the feeding group, is a little less than the average for the control group; on the fourth preliminary test, however, the averages for the two groups are almost identical. During the 5 weeks of supplementary vitamin feeding, the averages for both groups for the 25 second reading continue to increase, the averages of the feeding group being slightly higher except for the readings made at the end of the feeding period. None of the differences between the averages for these measurements is however, statistically significant. It may be mentioned, also, that at the end of the experiment 45 per cent of the children in the feeding group gave readings which are not considered normal by present criteria, and a slightly lower percentage of children in the control group gave similar readings.

The data given for the 10 minute adaptation reading are similar in general to those given for the 25 second reading. The averages for the initial preliminary test for both groups are essentially identical, and for this measurement the averages fall well within the range which by the proposed criteria is considered to represent normal vitamin A intake. On the fourth pre-

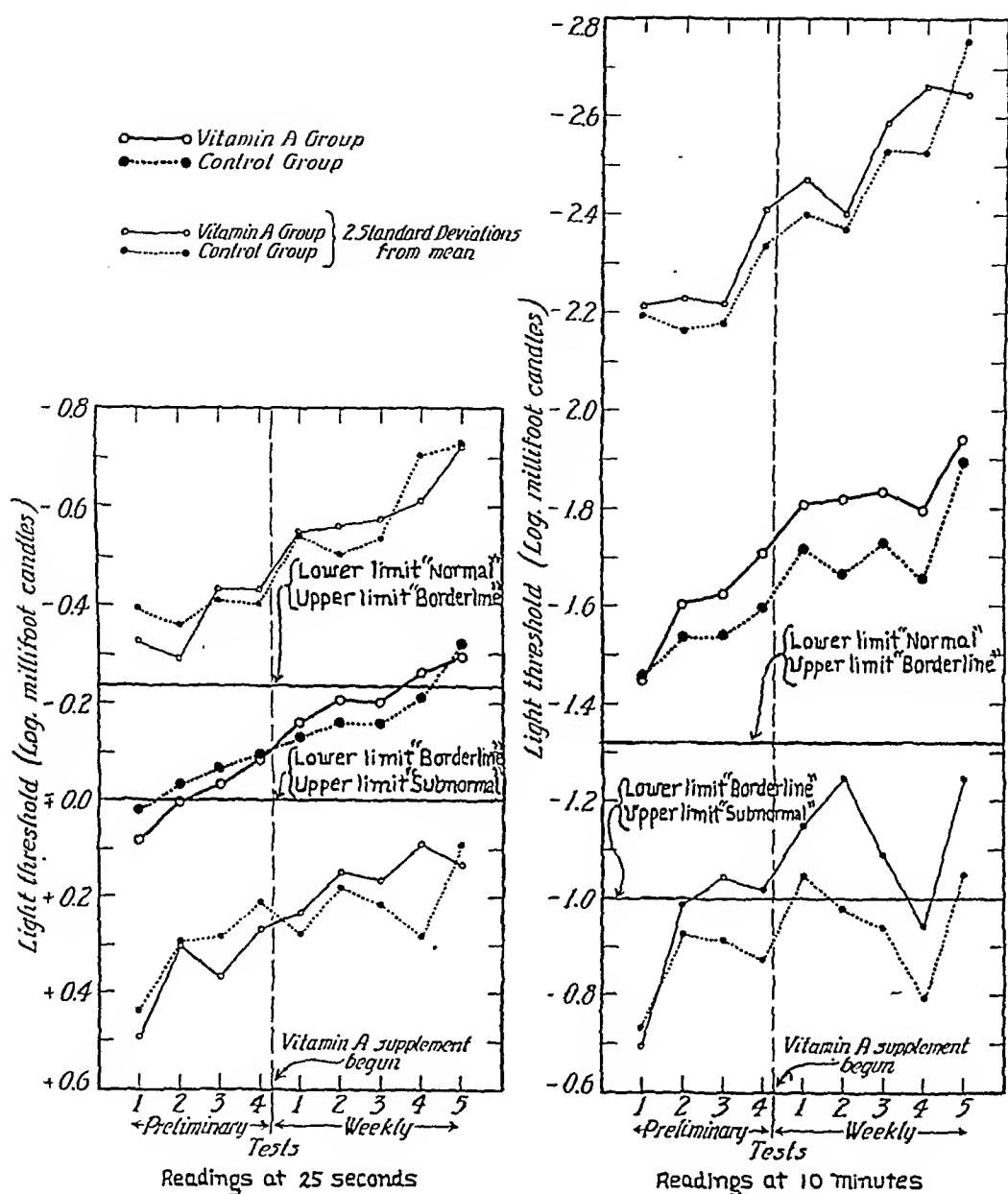


FIGURE I—Changes in means and standard deviations of biophotometer readings made at 25 seconds and at 10 minutes for feeding and control groups of children given 4 preliminary tests, followed by weekly tests for 5 weeks

liminary test the average for this reading for the group of children given large doses of the vitamin is somewhat higher than the average for the control group. The difference between the averages for the feeding and control groups is maintained at approximately the same value throughout the feeding period except for the measurement

made at the end of 5 weeks, at which time the averages for the two groups are again very similar. It is apparent that the measurement made 10 minutes after the beginning of the adaptation period shows great variation, and there seems to be some difference in favor of the feeding group. However, the major part of the difference appears

even before feeding was begun, and the averages of the two groups are essentially alike at the end of the feeding period. As a result of these findings, particularly in view of the enormous variability of the measurements, it is not possible to attribute the improvement in the measurements conclusively to the supplementary vitamin feeding.

DISCUSSION

In attempting to evaluate the meaning of this study, discussion of a number of points would appear indicated. These concern the possibility of fortuitous increase of the vitamin intake in the control group of children studied, the method of selecting the children for study on the basis of levels of deficiency determined by biophotometer tests, the insufficiency of evidence of the actual quantitative relationship between vitamin A and dark adaptation, and the relation of the herein presented findings to those of other workers in the field.

In connection with the first point, it is apparent that no rigorous control of the home dietaries was obtained for the children under study. Accordingly, it is possible that a coincidental increase of vitamin A in the diets of the children in the control group occurred. However, a significant change in the vitamin A content of the home diet in a large percentage of the 52 control subjects at this time—February, March and April—would appear to be unlikely.

With reference to the selection of subjects, it may be said that an attempt was made to select as many as possible of those children whose dark adaptation measurements indicated deficiency according to those criteria which have been proposed in the literature. However, in light of the shortcomings of the biophotometer technic, discussed in a previous publication,¹⁰

it is possible that the interpretation of deficiency may be inadequate, and as a result the possibility exists that few or no children with vitamin A deficiency were actually included in this study. These latter impressions are further supported by the findings of the present investigation that a large proportion (45 per cent) of the children who originally had subnormal or borderline readings failed to give normal adaptation measurements at 25 seconds even after receiving vitamin A concentrates. If such a large proportion of apparently healthy children fail to give "normal" measurements after supplementary feeding, it seems indicated that the proposed standards for the dark adaptation measurements with the biophotometer may be incorrect or too rigorous.

The question of the factual evidence now available for believing that a relationship exists between vitamin A and dark adaptation measurements is of importance in connection with the interpretation and evaluation of the results of this and other studies. In general, evidence for this belief is based on experiments in which dark adaptation measurements are made before and after a period of vitamin supplementation on groups of subjects without negative and comparable control studies. In the case of the feeding group studied here, a procedure was followed in which two groups, one fed and the other not fed the vitamin supplement, were tested. Since the results of this study, where a negative control group is included, are unsatisfactory and inconclusive, it is indicated that conclusions based on studies which do not include provision for controls may be considered questionable.

On the basis of the study here presented and the related discussion, it seems necessary to conclude that the biophotometer technic, in its present

form, cannot yet be considered reliable or satisfactory for detecting mild forms of vitamin A deficiency in children. It is apparent that this conclusion is not in harmony with the impressions of some other investigators. Reasons which form the basis of the differences in views regarding dark adaptation tests and vitamin A deficiency have been given in this and in a previous publication.¹⁰ These reasons appear cogent, but a careful evaluation of all the evidence now available concerning the biophotometer test reveals that conclusive results, either favorable or unfavorable, have not yet been obtained. On the basis of apparently sound theoretical considerations, it seems very probable that it *should* be possible to measure quantitatively the vitamin A nutritional status by means of dark adaptation tests. Equally sound considerations would appear to indicate that a satisfactory and practical methodology has not yet been developed for routine application in surveys of children.

SUMMARY

An investigation is reported in which the effect of vitamin A administration on biophotometer dark adaptation measurements in school children was studied. The results showed no significant difference in the improvement in biophotometer measurements between a group of children whose diet was sup-

plemented and a control group whose diet was not supplemented with vitamin A. The need is indicated for further work on the relationship between dark adaptation and vitamin A and on methods for measuring the relationship, particularly in surveys of children.

REFERENCES

1. Jeans, P. C., and Zentmire, Z. A Clinical Method for Determining Moderate Degrees of Vitamin A Deficiency. *J.A.M.A.*, 102:892 (Mar. 24), 1934.
2. Jeans, P. C., and Zentmire, Z. The Prevalence of Vitamin A Deficiency Among Iowa Children. *J.A.M.A.*, 106:996 (Mar. 21), 1936.
3. Park, I. O. Preliminary Observations on Vitamin A Deficiency as shown by Studies with the Visual Photometer. *J. Oklahoma State Med. Assoc.*, 28:359 (Oct.), 1935.
4. Park, I. O. Further Observations on Vitamin A Deficiency as Shown by Studies with the Visual Photometer and Clinically. *J. Oklahoma State Med. Assoc.*, 29:129 (Apr.), 1936.
5. Park, I. O. Significance of Vitamin A Deficiency. *Am. J. Digest. Dis. & Nutrition*. 3:193 (May.), 1936.
6. Jeghers, H. Night Blindness Due to Vitamin A Deficiency: A Consideration of Its Importance in Traffic Problems. *New England J. Med.*, 216:51 (Jan. 14), 1937.
7. Jeghers, H. Night Blindness as a Criterion of Vitamin A Deficiency: Review of the Literature with Preliminary Observations of the Degree and Prevalence of Vitamin A Deficiency Among Adults in Both Health and Disease. *Ann. Int. Med.*, 10:1304 (Mar.), 1937.
8. Snelling, C. E. A Study of the Birch-Hirschfeld Photometric Test for Vitamin A Deficiency. *J. Pediat.*, 9:655 (Nov.), 1936.
9. Jeans, P. C., Blanchard, E., and Zentmire, Z. Dark Adaptation and Vitamin A: A New Photometric Technic. *J.A.M.A.*, 108:451 (Feb. 6), 1937.
10. Palmer, C. E., and Blumberg, H. The Use of a Dark Adaptation Technique (Biophotometer) in the Measurement of Vitamin A Deficiency in Children. *Pub. Health Rep.*, 52:1403 (Oct. 8), 1937.
11. Jeghers, H. The Degree and Prevalence of Vitamin A Deficiency in Adults, with a Note on Its Experimental Production in Human Beings. *J.A.M.A.*, 109:756 (Sept. 4), 1937.

Present Status of Phosphatase Test for Pasteurization *

WALTER VON DOHLEN TIEDEMAN, M.C.E., F.A.P.H.A.
State Department of Health, Albany, N. Y.

HEALTH officials have long dreamed of the development and use of a practical test for pasteurization. Many tests have been tried and found wanting. In fact a test of this kind has long been a sort of mirage always alluringly just out of reach but never quite attainable.

In view of this it will not be surprising to encounter some skepticism, on the part of those who have not had experience in the use of the test, when we say that the millenium has come. A practical means of determining whether or not milk and cream have been properly pasteurized is now available in the so-called phosphatase test.

Examination of our own records of outbreaks of disease traced to raw milk have convinced us that pasteurization of milk is a practical and necessary safeguard to the public health. The opinion of health officials generally on this subject was well expressed by the following statement in a recent editorial on "Pasteurization in England and America" in the *American Journal of Public Health*: "Raw milk, whether in England or America, should no longer be permitted to impede public health progress." Health officials who recommend the use of pasteurized milk should be in a position to assure the

public that milk labeled "pasteurized" has actually received sufficient heat treatment to make it safe. The phosphatase test is the first means the health officer has had to determine whether a sample of milk has been adequately heat treated.

The literature has contained reports upon tests for heated milk¹ for the past 30 years or more. Some of the early tests would differentiate milk heated to about 70° C. or above from raw milk. The better known of these is that of Rothenfusser² designed to measure the effect of heat on the enzyme peroxidase. Modifications of this test^{3, 4, 5} based upon the effect of pasteurization on the enzyme diastase have been tried unsuccessfully as tests for pasteurization. Other tests for heated milk including the microscopic cellular test,^{6, 7} have failed to differentiate between pasteurized milk and milk undertreated in pasteurization. Some of these tests including the more recent amylase test as modified by Gould⁴ and by Leahy⁵ would differentiate, in our experience, between unheated milk and properly pasteurized milk but fail to show consistently dangerous degrees of undertreatment. Furthermore, on occasions our laboratory found amylase absent in samples of raw milk.

It seemed almost incredible that an enzyme could be found in milk that would lend itself to the purposes of a

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

test for pasteurization, that is, would be always present in raw milk in abundance and would be almost completely devitalized by the heat treatment required for the pasteurization of milk. Phosphatase is such an enzyme.

The test was developed by Kay and Graham.⁸ Reports from England indicating its successful use led us to try it out. In our work we have used a modification by F. W. Gilcreas⁹ in which color comparisons are made in test tubes instead of by tintometer. The technic has been reported elsewhere⁹ but a brief statement of the principle involved is in order. The test is based upon the action of the enzyme phosphatase which is present in raw milk but is almost completely devitalized by pasteurization, on a buffer substrate containing disodium phenol phosphate, Folins reagent being also added. During incubation for from 18 to 24 hours at 37° C., phenol is liberated in proportion to the amount of phosphatase present which after clarification of the sample is read by comparing the intensity of the blue color in test tubes with that produced by known concentrations of phenol or with permanent standards. Controls are used.

Preliminary tests with this technic on prepared samples unknown to the examiner indicated that the test will show as undertreated (a) milk held at 143° F. for 25 minutes, (b) milk held for 30 minutes at 141½° F. and (c) pasteurized milk to which as little as 0.1 of 1 per cent of raw milk had been added. Of course the test will not tell which of these three things has happened.

The New York City Department of Health has developed and used two other modifications of the test, one a quick test for field use, and the other a modification in which the samples are incubated for only 1 hour instead of from 18 to 24 hours and in which Gibbes reagent has been substituted

for Folins reagent in the determination of phenol content. Considerable comparative work is necessary before we can say whether one modification is superior to the other.

Our experience in the practical use of the test as well as that of other health departments has been favorable, indicating that the test has great possibilities. A critical trial of the test through the examination of split samples by a group of coöperating laboratories throughout the country is being undertaken under the direction of the Association of Official Agricultural Chemists with a view to having it adopted as a standard method of milk analysis.

In New York State we have examined since 1935 more than 2,000 samples of pasteurized milk and cream. Notwithstanding our previous work in the inspection of pasteurizing plants and in the examination by standard plate count and coliform test of process samples collected at such plants, we found that 8 per cent of samples examined by the phosphatase test were actually raw, and another 21 per cent of samples indicated undertreatment or the addition of raw milk to pasteurized. A total of 632, or about 29 per cent, of the samples were unsatisfactory. In every instance follow-up inspections at the plant resulted in either (a) the operator admitting what had happened to cause undertreatment, (b) our inspector otherwise securing evidence of what was wrong, or (c) in a few difficult cases in our demonstrating that samples processed in what was claimed to be the usual manner but in the presence of our inspector gave properly pasteurized reactions when examined by the phosphatase test.

A review of some typical examples of violations that were found should be of interest.

In one instance the operator was not convinced of the necessity for pas-

teurization and admitted that he bottled raw milk and labeled it pasteurized.

In another instance the dealer sold raw milk to a plant and bought bottled pasteurized milk which the test showed was properly pasteurized. However, a sample of his pasteurized cream gave a raw reaction. He admitted separating some raw milk from his own herd because he only needed a small amount and this was a cheap way of getting cream which he thought had better viscosity than the pasteurized cream he could purchase.

At another plant, the recording thermometer registered $1\frac{1}{2}^{\circ}$ F. higher than the indicating thermometer, resulting in underheating the milk by that amount although it had checked correctly at the time of the last previous inspection.

Still another investigation showed that the recording thermometer clock ran fast, showing 30 minutes holding when actually only 25 minutes had elapsed.

At one plant our investigator found a 24 hour chart was incorrectly used on a recorder built to use 12 hour charts resulting in 15 minutes holding when 30 minutes was shown on the chart.

A potentially dangerous situation resulted when a boiler flue burned out and after unsuccessfully trying to have it repaired in time for the next day's run the dealer took a chance on selling the raw milk. We chanced to collect a routine sample of the milk and detected this by the phosphatase test. He claimed it was the first time this had happened in his 13 years in business.

In following up another unsatisfactory result our investigator found that the operator had forgotten to close the outlet valve before filling the pasteurizer, permitting unpasteurized milk to fill the outlet line as far as the milk pump.

Still another investigation showed

that a leak protected outlet valve of the older type was left in a closed position in which the mating grooves were not mated, permitting underpasteurized milk to enter the outlet line.

In a number of instances operators pushed charts by hand from 5 to 15 minutes, thus cutting the holding period at pasteurizing temperature that much to save time.

In several instances raw milk was added to 40 per cent pasteurized cream to make 20 per cent cream.

Another investigation showed that properly pasteurized milk for sale in bulk was placed in a can from which raw milk had been dumped without subsequent washing and sterilization.

One of the more difficult investigations showed that properly pasteurized milk remaining in the pipe lines and bottler when bottling was finished was drawn off in a can that had contained raw milk but had not been subsequently washed and sterilized and was thence dumped into the separator. The cream made from this milk gave an undertreated reaction.

In a large cream plant an interconnection existed in the complicated milk piping to permit raw cream to be cooled over the same surface cooler used for pasteurized cream of which a number of samples gave an underpasteurized test.

One thrifty but poorly informed plant operator caught the drippage of underpasteurized milk from a leak protector outlet valve in a can cover and emptied it into the batch of properly pasteurized milk.

Our investigators found that the undertreated reaction on pasteurized milk at one plant was due to failure to operate the agitator in the small pasteurizer during holding. Milk near the outlet valve was found to be about 5° below pasteurizing temperature. The operator said that he did not use the agitator during holding because when

he started it the temperature dropped on the recording thermometer chart.

Last and perhaps most interesting, the phosphatase test gave a raw reaction on a sample of milk from a 40 quart can at one of two children's camps in which simultaneous outbreaks of gastroenteritis occurred last summer. An investigation at the pasteurizing plant furnishing milk to both camps showed that cans of unlabeled raw milk were stored in ice water in the same vat with unlabeled cans of pasteurized milk. It was evident that a can of raw milk had been either accidentally or wilfully delivered to each of the camps in place of pasteurized milk.

The phosphatase test also has been used extensively during the past year by our two greatest cities—New York and Chicago. The Department of Health of New York City reports having made in excess of 10,000 tests. Similarly the Health Department of the City of Chicago reports having made thousands of tests by the unmodified Kay and Graham technic. Both departments have found enough under-treated reactions to convince them of the value of the test.

Reports also show that the test has been used during the past year by the City Health Departments in Jacksonville, Fla., and Utica, N. Y., and by the Westchester, Cattaraugus, and Tompkins County Health Departments in New York State. Undoubtedly other health departments not heard from also are using the test.

It is not reasonable to assume that conditions in pasteurizing plants in New York State or in New York City or

Chicago are much different from those in plants in other sections of the country. Those conditions might have been more serious if it were not for the facts that (a) all raw milk is not infected, and (b) pasteurization provides many factors of safety in both temperature and holding time.

Experience in the practical use of the phosphatase test for pasteurization convinces us that it has great practical value. Although continued use may reveal interfering substances, no serious interference has been encountered to date. Those health officials who recognize the importance of pasteurization of milk to public health and their responsibility to the public to see that milk and cream so labeled are actually pasteurized will welcome this test.

REFERENCES

1. Schardinger, F. Über das Verhalten der Kuhmilch gegen Methylenblau und seine Verwendung zur Unterscheidung von gekochter und ungekochter Milch. *Z. Nahr. Genussm.*, 5:1113, 1902.
2. Rothenfusser, S. Methoden des Nachweises einer stattgehabten Erhitzung von Milch und Molkereiprodukten. *Milchwirtschaftliches Zentr.*, 6: 468, 1910.
3. Rothenfusser, S. Über den Nachweis einer Erhitzung der Milch und ein neues Verfahren zum Nachweise der Däuerpasteurisierung. *Z. Unters. Lebens.*, 60:94, 1930.
4. Gould, Bernard S. The Detection of Inefficiently Pasteurized Milk Based on a Modification of the New Rothenfusser Test. *J. Dairy Sci.*, 15:230, 1932.
5. Leahy, Harold W. A Practical Test of Pasteurization. *23rd Annual Rpt. Int. Assoc. Dairy and Milk Inspect.*, 1934, p. 93.
6. Frost, W. D. A Microscopic Test for Pasteurized Milk. *J.A.M.A.*, 64:821, 1915.
7. Frost, W. D., and Moore, C. D. The Cellular Test for Pasteurized Milk under Practical Conditions. *J. Dairy Sci.*, 2:189, 1919.
8. Kay, H. D., and Graham, W. R. The Phosphatase Test for Pasteurized Milk. *J. Dairy Res.*, 6:191, 1935.
9. Gilcreas, F. W., and Davis, W. S. Investigation of the Amylase and Phosphatase Tests as an Indication of Pasteurization. *10th Annual Rpt. New York State Assoc. Dairy & Milk Inspect.*, 1936, p. 73.

DISCUSSION

PAUL F. KRUEGER

Director, Bureau of Dairy Products, Board of Health, Chicago, Ill.

UNDER the personal direction of Dr. Herman N. Bundesen, the Chicago Board of Health has been interested for a number of years in developing a suitable test or tests for determining the efficiency of pasteurization. Working independently, and also in an attempt to evaluate the practical value of various tests contained in the literature from time to time, it was found that the so-called "enzyme" tests had the greatest possibilities for this purpose.

Our early work done in connection with the phosphatase test followed the suggestion of the New York State Department of Health that by this method it was possible to determine quite small irregularities in the pasteurization process.

It was found early in our experimental work with the phosphatase test, that it indicated that a much greater amount of milk and cream was improperly pasteurized than we believed was actually occurring. True, in many of the first cases found, it was possible to discover and correct defects in plant practice when the phosphatase test indicated improper pasteurization. In some of the instances, however, in which the test indicated improper pasteurization, it was very difficult if not impossible to find the unsatisfactory conditions. It was essential, therefore, that sufficient work be done in the field to establish definitely the correlation between test and actuality.

If the phosphatase test was to be an important part of our milk control program, we must have the assurance that when samples were found bad, there was a corresponding error in operation somewhere that must be corrected.

It was early established that the use of the phosphatase test, as originally detailed by Kay and Graham in their "B" test, gave satisfactory results in the laboratory. This test was operated purposely without modification, an 8 hour incubation period being used to correspond to our required pasteurizing temperature of 144° F.

Routine tests were made by this method of the thousands of samples of milk, and of cream and other milk products collected for chemical and bacteriological analysis in the City of Chicago from every plant under our supervision.

For months painstaking work in the field was done to determine what factors, if any, may affect the accuracy of the test. Without detailing this work, the following conclusion summarizes our results: Pasteurized milk handled in accordance with our requirements will have a blue color lighter than 2.3 lovibond units when subjected to the phosphatase test as described by Kay and Graham (*Journal Dairy Research*, May, 1935).

A color intensity of 2.3 lovibond units or more definitely indicates that:

1. The milk has been insufficiently heated;
2. The milk has been insufficiently held; or
3. Raw milk has been added to the pasteurized milk during the holding period or thereafter.

The number of units above 2.3 indicate approximately the seriousness of the violation.

The test may be applied to milk, skim milk, soft curd milk, vitamin D milk, homogenized milk, goat milk, cream, and ice cream mix. It is not wholly satisfactory for chocolate or cocoa milk and beverages, and for ice

cream to which certain colors and flavors have been added.

The reason so much time was spent by the Board of Health in determining the actual efficiency of the test was the fact that a considerable number of samples of milk and milk products were at first found to be improperly pasteurized, the cause for which we were at a loss to understand. This difficulty was due mainly to our reluctance to believe that so many milk plant employees would rather pasteurize fraudulently than do the work properly. It was soon established, however, that the greatest number of cases of fraudulent pasteurization was due to the faking of the pasteurizer chart by the employee operating the pasteurizing equipment.

The reason it was so difficult on our part to determine fraudulent "pulling" of charts was, first, that the use of air space heaters on all milk pasteurizer vats has made it possible for the plant operators to make a straight line on the chart during the holding period. Previous to the use of these heaters the line would normally vary noticeably throughout the holding period so as to make it easily possible to detect a fraudulent chart. Secondly, during most months of the year the raw milk before pasteurization is lower than the 30,000 bacterial standard for pasteurized milk, so that an excessively high plate count did not always result.

When asked why charts had been tampered with, the pasteurizer operator replied with such reasons as, "I wanted to hurry to get through." "I had too much work to do." "I wanted to quit early because of a holiday or Sunday." It is interesting to note that more than 80 per cent of the illegal samples were found to have been pasteurized on a Sunday or a holiday.

In order to overcome this tendency on the part of operators to make fraudulent pasteurizer charts, it was re-

quired that every recording thermometer in the pasteurizing plants under our supervision be modified so that the center hub of the instrument would have attached to it two or more pins to which the chart may be fastened. Should a chart be fraudulently moved, once it has been set on an instrument so equipped, there would either be a tear in the chart at the pins, or a duplicate set of perforations would be made which could be easily detected. This improvement, which was readily provided by all the instrument manufacturers at our request, has proved to be very satisfactory.

Another trick that a dishonest operator may resort to is to open the pasteurizer valve before the end of the 30 minute holding period. We are working at present with the recording instrument manufacturers with a view to installing additional pens or other devices on the recording thermometer which will record the closing and opening of the inlet and outlet valves of the vat or pocket pasteurizer.

In addition to the fraudulent pasteurization described, it was found in other instances that milk was improperly pasteurized although the operator did not know such a condition existed. Some of the reasons found in these instances were:

1. The outlet valve of the pasteurizer vat was not fully closed before the inlet was opened.

2. The raw milk inlet valve to the vat was not fully closed or was leaking.

3. The pasteurizer outlet valve was not fully closed.

4. The use of the same equipment and containers for pasteurized milk as for raw milk without thorough cleaning and sterilization between usages.

5. When small batches are pasteurized in a large pasteurizer, at times the indicating and recording thermometer bulbs do not reach the liquid and so record air temperatures. When air-space heating equipment is used the result is that considerably higher temperatures are recorded than the product actually reaches.

Automatic equipment has been found singularly free from pasteurization defects. Perhaps this is due to a great extent to the fact that all automatic heaters are equipped with pump stop control devices, which we have found to be singularly free from mechanical operating difficulties. Only two instances were found of improperly pasteurized milk in such equipment, and the cause of both of these errors was also readily discerned from an examination of the recording thermometer charts.

We are at present conducting a series of experiments in the application of the phosphatase test to butter and to cheeses of various types. Inasmuch as age and degree of refrigeration seem to affect the results of the test in connection with these products, no definite conclusions

are possible at present. The value of a satisfactory test of this nature when applied to these products should prove of inestimable value to the health officer.

In conclusion, it may be said that the upper limit of the phosphatase test has been set low enough so that the enforcement official may be sure there is need of correction whenever that limit has been reached or exceeded.

The application of the phosphatase test will not do away with the necessity for pasteurization plant inspection. Effective inspection work must be continued just as before if we are to be assured of proper plant operation at all times. The phosphatase test should be looked upon as an additional weapon in the hands of the health officer in his work of milk sanitation enforcement.

SOL PINCUS, C.E., F.A.P.H.A.

Deputy Commissioner, Department of Health, New York, N. Y.

WE, in New York City, have long hoped for a positive test to determine the occurrence of improper pasteurization of milk and cream. Three years ago our department experimented with the amylase test which we then applied in special investigations. This test, which was highly recommended at that time, gave promising results.

In August, 1935, about 6 months after we had begun work with the amylase test, we found the reference to the Kay and Graham phosphatase test in the reports of the British Ministry of Health. However, we encountered difficulties in obtaining the required chemicals for the phosphatase test, and since the first results with the amylase test showed promise, we put aside investigation of the British test.

When the series of comparative tests which were undertaken in cooperation with the State Department of Health to determine the value of the amylase

test proved that there were some difficulties with this test, we at once proceeded to make a thorough investigation of the Kay and Graham phosphatase test on a large scale. Several modifications of the standard British tests were tried by our laboratory to simplify the procedure and shorten the time for obtaining the result. As a consequence of this study, we found it advisable to replace the veronal buffer used by Kay and Graham with a borate sodium hydroxide buffer and to purify the substrate diphenolsodium-phosphate so as to remove the residual phenol. Through the substitution of a more sensitive phenol detecting agent, namely, 2,6 dibromoquinonchloromide (a reagent similar to the one used in the Gibbs test for phenol in water), we were enabled to reduce the time to a 1 hour incubation period and still retain an accuracy comparable to that of the Kay and Graham technic requiring a 24 hours incubation.

A further modification permitted the use of this procedure as a quick field test by the inspectors, requiring less than 20 minutes.

The accuracy of the laboratory method with the 1 hour incubation is such that we can detect a drop of 1°F . in temperature, a shortening of the holding time of 5 minutes, or the addition of $1/5$ to $1/2$ per cent of raw milk through leakage or through any other defect. The field test will detect a drop of 2° in temperature, a reduction of holding time of 10 minutes, or the addition of 1 per cent of raw milk.

Since the substrate has a tendency to decompose on standing or ageing, we have developed tablets for both the necessary solutions, namely, the buffer substrate and the buffer reagent. This makes it possible for an inspector in the country to be supplied with material from which he can make fresh stable solutions.

Our field test, we believe, is a significant innovation, as improperly pasteurized products may be detected at the plant or railroad yards by our inspectors, who can thereby prevent the marketing and consumption of such products.

The field test has also a psychological and educational value. The plant employee or the plant operator, having seen that the inspector can detect the presence of improperly pasteurized milk, will be more careful that the products are fully pasteurized. It is also more convincing to see the results of a test run at the milk plant than merely to receive a verbal or written notice to the effect that pasteurization operations were not correctly performed.

All samples delivered to our laboratories for chemical or bacteriological analysis are also being tested routinely for pasteurization. Whenever our laboratory tests show irregularity involving a country pasteurizing plant, the

plant operator and our district inspector are notified of the findings. Our city inspectors are immediately assigned to meet the truck or train bringing the product into New York City that day. The field test is performed for pasteurization, and samples are submitted for laboratory test. An abnormal reaction on the field test results in the embargo of the product, which is released only for manufacturing purposes and after repasteurization. At times we find it necessary to exclude plants immediately as a source of milk supply and cream supply for New York City on the basis of our phosphatase test findings. Such plants are kept out until there is sufficient proof that the irregularity has been corrected.

The procedure is similar when city pasteurizing plants are involved, except that our inspectors can be dispatched to the plant within a short time to test the product stored there, and to check the pasteurizing operation.

During the period from April 1 to September 20, 1937, our department examined by this test, 10,635 routine milk and cream samples brought into the laboratories for chemical and bacteriological analyses. Five hundred and fourteen or 4.7 per cent, showed evidence of irregularity in pasteurization to a lesser or greater degree.

During this period we also examined 1,081 samples of milk and cream which were collected from suspicious sources, and of products indicated by our routine tests to be improperly pasteurized. Two hundred and fifty-seven, or 23.77 per cent, of these samples which were collected specifically for pasteurization test were found to be not fully pasteurized.

In addition, our inspectors also applied the field test to about 2,000 samples of milk and cream, finding 219 to be improperly pasteurized.

Some of the more common defects disclosed at the pasteurization plants

as the result of our phosphatase test findings, were as follows:

1. Standardization of fully pasteurized cream with raw or improperly pasteurized skim or whole milk was taking place. In some cases the practice was to standardize the pasteurized cream in the can by scooping out a few quarts of cream from the can and replacing it with skim milk, or milk which was raw, such as certified milk dumped from bottles returned by routes.

2. Recording thermometers were incorrect and registered too high a temperature. In one instance we found the bulb of the recording thermometer resting on the bottom metal portion of the tank, causing the registration of a 4° higher temperature than the actual temperature of the product in the pasteurizing tank.

3. Leaks from the outlet valves of the pasteurizer occurred during the filling and holding period, permitting the seepage of raw or partly pasteurized product into the outlet pipe.

4. Excessive foam was found on the surface of the product in the pasteurizer, held at a temperature less than 143° F. in the pasteurizing process.

5. Agitators were not used during the holding period, causing in some types of equipment, a portion of the milk to be below 143° F.

6. Pasteurized product was run over coolers and over equipment previously used for raw product, without adequate washing and sterilization after such use.

7. Holding of product in the pasteurizing process at 143° F. took place for a period less than 30 minutes. Frequently, this irregularity could not be determined from the recording thermometer due to the time element involved in filling and emptying the tank.

8. Inexperienced pasteurizing operators were substituted during illness, or for other absence of the regular operator. Such operators frequently do not turn the inlet or outlet valve in a correct position to close the inlet and outlet of the pasteurizer fully during the holding period, with the result that some raw product enters the holder, or some not fully pasteurized product enters the outlet pipe of the holder.

In one instance where a continuous long-flow pasteurizer was in use, we found that the electrical pump which was to force the milk through the pasteurizer at a definite rate had been sub-

stituted by a steam pump. The rate of flow was irregular and apparently above the permitted capacity of the pasteurizer.

As the result of these findings, we are emphasizing the following requirements:

a. That cream be standardized before pasteurization.

b. That the operator check the recording thermometer daily and that the result of such check be indicated, in ink, on the recording thermometer chart, with the signature of the employee making the thermometer observation.

c. That inlet and outlet valves be examined as to possible leakage.

d. That efforts be made to reduce the foam on the surface of the product during pasteurization.

e. That agitators in pasteurizing holders, which are not properly insulated, should be used during the holding period.

f. That separate equipment be provided for the handling of the raw products, and for the handling of pasteurized products.

We feel that to eliminate the possible irregularity due to the inexperienced or careless operator, it would be desirable to require that all pasteurizing equipment be automatically controlled as to temperature and holding time.

I believe that the phosphatase test represents one of the greatest developments in milk control since the inception of pasteurization. It is amazing that one can as the result of this test determine in New York City that the pasteurizing equipment is not functioning properly at a country plant 200 or 300 miles away, or that the employee in charge of the pasteurization has hurried the operation, or otherwise failed to pasteurize the milk or cream properly. A forecast of the great significance of the phosphatase test was made by Governor Herbert H. Lehman before the American Public Health Association convention on October 5 last, when he stated that it "bids fair to revolutionize milk control policies throughout the United States."

Nutritional Influence on Teeth*

FRANCES KRASNOW, PH.D.

Assistant Director and Head, Department of Biochemistry, School for Dental Hygiene, Murry and Leonie Guggenheim Dental Clinic, New York, N. Y.

THE title is not intended to convey the idea that tooth conditions are affected very specifically by the intake of certain foods entirely independently of others which are required by the body generally. Recent research is fast reverting to the original concept that the complex organism is a unit entity. Dental health is no less a resultant of those conditions which make for the health and life of the body as a whole than it is itself one of these factors.¹

Only the balanced diet (including proper supply of oxygen) will meet the food requirements for absolute health—be it tooth health, ear health, eye health, the health of any other organ or group of organs, or the general health of an individual. Since life begins *in utero*, the foundations of normal well-being depend upon the supply of the essential materials made available through the mother—the health of the latter not being of lesser importance.² Furthermore, the balanced diet should be viewed as part of a complete medicodental clinical and laboratory examination. It should be interpreted as a variable depending upon: (1) age, (2) sex, (3) body build (especially weight and height), (4) occupation, (5) cli-

mate (season, immediate atmospheric environment), (6) physiological state; i.e. (a) extent of freedom from physical and mental fatigue based on the hours of rest essential to take one through the daily tasks without the feeling of being tired; (b) extent of freedom from disease, be this due to metabolic malfunction, *per se*, parasitic invasion, or poisoning by toxins of varied nature other than those arising from infection.

These factors determine both qualitatively and quantitatively the make-up of any dietary and, broadly considered, diet regulation is only part of a comprehensive scheme to bring about scrupulous individual hygiene and in turn controlled community hygiene.

A balanced diet may be defined as one which supplies the body at the *required rate* with the proper quantity of substances necessary to build and repair tissues and create heat and energy. The substances may be classified conveniently as (1) proteins including all essential amino acids, (2) lipids including all essential fatty acids, (3) carbohydrates, (4) minerals, (5) vitamins, (6) water, and (7) roughage. Indeed the correct quantity of each food class does not necessarily mean the correct quantity of the essential nutrients. It is extremely important to safeguard the several innate qualities which any foodstuff represents:

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

1. At the source of production—Thus, milk from healthy cows grazing in good pasture is richer than that from cows fed on dry, carelessly mixed feed; also, vegetables from different soils differ markedly, as for example, those from soils watered by sea water will contain iodine whereas those from soils in fresh water regions are practically devoid of this essential element.

2. By correct preservation before reaching the consumer—The responsibility of obtaining only carefully preserved products, in good part, falls upon the consumer. Precaution in purchasing new brands will help a great deal toward freeing the market of poor varieties.

3. By preservation by the consumer.

4. By proper preparation—The chief error in this regard is marked overcooking, frequently in uncovered containers and with a large quantity of water which is usually discarded. Such methods deplete the foods of the very properties for which they have been selected—vitamins lose their effective characteristics entirely, or at least to a large extent, due to excessive heat and oxidation; the minerals dissolve when excess water is used, and if poured off as waste leave the particular foodstuff less valuable as a nutrient source. The end result is inferior food with inevitable poor nutrition and ill health either of the organism as a whole or of one or more of its organs. This leads to increased expenditure for upholding health standards.

Food value is not always proportionate to price. Thus, the high cost purified foods should really be regarded as delicacies and for low income groups must be omitted entirely. Witness also, the favoritism for white-shell eggs as compared with the much less expensive brown-shell ones; or, pure white tightly packed lettuce instead of beet tops.

Variety is frequently stressed as a rule of thumb for obtaining a correct dietary. There is no doubt that greater adequacy may be secured, and if guided by accepted standard requirements daily menus can be arranged which would apparently be commensurate with the needs for normal metabolic activity; yet recent investigation finds that even good combinations may be unbalanced.

Researches on the quantitative salivary analysis of individuals suffering

from caries or erosion indicate characteristically different chemical pictures of saliva for different dental conditions.⁵ Chart I summarizes some recent data. The analytical figures have been tabulated to show average values, incidence above the average normal range, and odds against random occurrence of deviations from the normal. Thus for erosion, the average hydrogen ion concentration, calcium, magnesium, inorganic phosphate, protein, lipid phosphorus (otherwise called alcohol-ether soluble phosphorus and lecithin) or cholesterol lies entirely beyond that for the same constituent in saliva of normal individuals. Compare the values 6.83, 7.6, 0.75, 18.0, 446, 0.52, 11.2 respectively with 7.14, 6.3, 0.46, 15.2, 298, 0.13, 7.5. The standard deviations are relatively small. None of the average ranges overlap, hence variations from the normal are probably significant. There are apparently two types of erosion, each with a specific salivary composition. One with alkaline saliva yields markedly lower concentrations: hydrogen ion, calcium, magnesium, and protein approach the normal; inorganic phosphate and cholesterol fall below, lipid phosphorus above. The other presents an acid saliva with much higher levels—6.73, 8.2, 0.84, 19.7, 489, 0.60, 12.9 for the analyses in the order listed instead of 6.83, 7.6, 0.75, 18.0, 446, 0.52, 11.2 respectively.

If instead of averages, the distribution with respect to the average normal range be considered, there appears a very high incidence of cases above the high normal level. It is noteworthy that for each analysis, the concentration exceeded the high normal figure in more than 50 per cent of salivas from subjects suffering with erosion. Again, the figures are accentuated for the acid subgroup. Compare 87, 87, 60, 80, 86, 65 with 74, 68, 53, 68, 78, 57 respectively for the percentage of cases yielding salivary calcium, mag-

CHART I

Analyses of Total Unstimulated Saliva⁵

*Summary of Results Obtained by Three Common Statistical Methods
for Evaluating Probable Significance of Figures*

Analyses	Erosion*									Caries†								
	Average Range Not Overlapping Normal			Distribution More than 50% Above Average Nor- mal Range			Odds Against Random Deviations Based on D/P.E. ⁶			Average Range Not Overlapping Normal			Distribution More than 50% Above Average Nor- mal Range			Odds Against Random Deviations Based on D/P.E. ⁶		
	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid	Total	Alk.	Acid
H, pH	6.83 ±0.05	7.19 ±0.07	6.73 ±0.04	89	.	..	1341	1.0	15x10 ⁵	6.92 ±0.06	7.21 ±0.04	6.71 ±0.04	62	.	.	26.4	1.9	4x10 ⁵
Ca.....	7.6 ±0.5	5.5 ±0.5	8.2 ±0.5	74	25	87	6.3	1.6	13.6	6.2 ±0.2	6.0 ±0.25	6.4 ±0.19	22	11	33	....	1.0	.....
Mg.....	0.75 ±0.10	0.42 ±0.04	0.84 ±0.12	68	0	87	8.5	1.0	13.6	0.65 ±0.06	0.63 ±0.06	0.73 ±0.08	65	67	75	5.4	2.2	9.9
PO ₄	18.0 ±1.4	12.2 ±1.6	19.7 ±1.5	53	25	60	2.6	2.6	9.9	14.4 ±0.6	12.6 ±0.7	15.2 ±0.7	39	11	50	1.0	6.3	.....
Protein..	446 ±46	284 ±33	489 ±53	68	25	80	22.2	..	44.8	346 ±24	315 ±33	359 ±39	54	33	67	3.0	1.0	2.2
L.P.....	0.52 ±0.11	0.26 ±0.11	0.60 ±0.14	78	50	86	37.4	1.4	44.8	0.20 ±0.03	0.19 ±0.02	0.22 ±0.04	63	78	50	7.3	4.6	3.5
Chol....	11.2 ±2.0	5.3 ±2.1	12.9 ±2.5	57	25	65	3.5	1.0	7.3	10.7 ±0.77	9.2 ±0.7	11.9 ±1.2	82	67	92	31.4	3.0	26.4

Normal values obtained from analyses on subjects who as far as medico-dental clinical and laboratory tests could discern had no ailments—pH: 7.14 ± 0.04 , Calcium: 6.3 ± 0.4 , Magnesium: 0.46 ± 0.07 , Inorganic Phosphate: 15.2 ± 1.0 , Protein: 298 ± 17 , Lipid Phosphorus: 0.13 ± 0.02 , Cholesterol: 7.5 ± 0.7 .

* Erosion refers to subjects suffering from wastings: erosions or abrasions.

† Caries refers to subjects with active decay processes only.

nesium, inorganic phosphorus, protein, lipid phosphorus and cholesterol above the high average normal content, again pointing to the probability that the variations are real. Finally, computations for odds against the chance occurrence of differences for the acid group yielded odds greater than 4 for all substances studied and so the suggested statistical significance is verified a third time.

In caries-active individuals variations from the normal are fewer—non-overlapping figures appearing only for pH, magnesium, lipid phosphorus and cholesterol, with values of 6.92, 0.65, 0.20, 10.7 respectively instead of 7.14, 0.46, 0.13, 7.5. Also for caries, there exist

apparently two distinct types—one with alkaline saliva, the other with acid saliva. The former presents a

CHART II

*The Murry and Leonie Guggenheim Dental
Clinic Diet Booklet **

Name

Address

Weight

Height

Date

Diet Record:

Specific foods and accurate amounts of
each taken at every meal and between
meals

* The dimensions are 4" wide by 8" long.

CHART III

NAME _____		NO. _____		DATE _____		OPERATOR _____		REMARKS _____			
KEY DEGREE OF CARIES 1. ENAMEL ONLY 2. ENAMEL & DENTIN 3. INVOLVING PULP + OR - PULP VITALITY	RIGHT UPPER										
	LEFT UPPER										
DEGREE OF CARIES											
MISCELLANEOUS											
RECOMMENDED											
H. RECESSION G. GINGIVITIS T.O. TRAUMATIC OCCLUSION K.P. RAREFACTION H.R. RETAINED ROOT I. IMPACTION M. MISSING TOOTH X. EXTRACTED TOOTH	RIGHT LOWER										
	LEFT LOWER										
DEGREE OF CARIES											
MISCELLANEOUS											
RECOMMENDED											

reduction in inorganic phosphate from 14.4 to 12.6 (almost to the same level as in erosion associated with alkaline saliva; pH, calcium and protein remain normal but magnesium, lipid phosphorus and cholesterol are high. On

the other hand, differences from the normal are enhanced in the acid saliva subgroup. The pH is depressed to 6.71, magnesium, lipid phosphorus and cholesterol are increased to 0.73, 0.22 and 11.9. Evaluation of the analytical figures by ascertaining the percentage incidence or the odds against randomness showed the same close agreement of the different statistical methods which was indicated for the erosion studies.

It seems plausible to assume a common mechanism at work. The results imply a tendency to that type of derangement often associated with acidic states in the body, notwithstanding that the subjects, for the most part, had no other pathological involvement as far as the usual medico-dental clinical and laboratory tests could discern. Detailed perusal of accumulated data, coordinated with the fact that the organism makes every effort to rid itself of acid ions in salt form, led to the examination of the dietary acid-base potentialities in addition to the usual orthodox factors.^{1, 14, 15}

In the plan adopted¹ the chief criteria of physiologic response are subjective guides, clinical manifestations (roentgenograms), weight changes and variation in the chemical composition of saliva. To insure saliva samples

CHART IV

Date _____

Chief Complaint:	_____
Present Illness:	_____
Past History:	_____
Family History:	_____
General Inspection:	_____
Description of local lesion:	_____
(1) Extraoral	_____
(2) Intraoral	_____
Urine:	_____
Blood:	_____
Remarks:	_____
Diagnosis:	_____
Operation:	_____

CHART V

The Murry and Leonie Guggenheim Dental Clinic
Saliva Analysis

Original Record Card (Side 1) *

Name	Dentist	No.
Address	Address	Date
Telephone	Telephone	
Age	Sex	Weight
		Height
		Race
		Religion

General Habits:

Occupation

Hours of work

Rest: Sleep: Hours

Diet: Supplementary details of diet not in booklet, such as size of portion, enjoyment of food, appetite, regularity of intake

Water

Medical Examination: Supplementary details of more personal nature previously omitted

Saliva

Collection

pH (cell)

Under oil

Suction

* The dimensions are 5" wide by 8" long.

which are duplicable and representative of an individual, conditions are set for a definite metabolic plane over at least one week preceding any analyses. They include (1) no recent mishap or illness, (2) thorough brushing of the teeth and washing of the mouth just before retiring the evening preceding each test day, (3) 8 hours sleep during the night prior to each test day, (4) no brushing of the teeth or rinsing of the mouth nor having breakfast (water) or smoking on the morning of each test, (5) a $1\frac{1}{2}$ to 2 hour interval between rising and collections, this interval including a 15 minute rest period at the laboratory, and (6) a detailed record of meals.

Each patient receives the diet booklet represented in Chart II. The pages are individually dated or otherwise marked when necessary. This is returned the morning of the laboratory appointment and filed with Charts III and IV which have been filled out by the dentist.

Samples of saliva are obtained under the standardized conditions outlined. First, a small sample (about 1.0 c.c.)

is collected by spontaneous flow for the determination of the pH, which is carried out immediately.⁸ Then a large sample (40.0 c.c.) is accumulated with the aid of suction and a saliva ejector. As soon as this is completed, the patient is questioned to ascertain supplementary details noted on the original record card shown in Chart V. At this time a full set of X-rays is taken and a final check-up of the extent of tooth involvement is made. Aliquots of saliva are measured for the analysis of calcium,⁹ magnesium,¹⁰ inorganic phosphate,⁹ lipid phosphorus,¹¹ cholesterol,¹² and protein¹³ (Chart VI).

The weekly food intake recorded in the diet booklet is analyzed with reference to acidic factors (meat, fish, eggs, cereal, flour products), basic factors (fruits and vegetables with few exceptions), milk and milk equivalents, vitamins, water, and caloric intake (Chart VII). This probable habitual consumption together with the other findings assembled, as noted in Charts II-VI, is used to deduce the additional needs commensurate with the individual's requirements.

CHART VI

The Murry and Leonie Guggenheim
Dental Clinic

Original Record Card (Side 2)

Name _____ Dentist _____ No. _____
Analysis: Whole Saliva _____ Date _____

Date	Det	Sample	Reading	Calculation	Result	Final
	pH					
	Ca					
	Mg					
	P In- or- ganic					
	Lipid P					
	Choles- terol					
	Pro- tein					
	Misc.					

Finally a complete summary is prepared as in Chart VIII. The clinic or the dentist using our consulting laboratory service receives a copy of the entire report for filing and a carbon duplicate of the recommendations given to the patient.

As noted in Chart VIII, the diet is checked for the last week of each month. After the patient has carried out the suggestions for 4 to 6 months, another complete analysis is instituted. Chart IX indicates the return to the normal level of phosphorus (inorganic phosphate), magnesium, cholesterol, and lecithin (lipid phosphorus or alco-

hol-ether soluble phosphorus) within 4 months. There was no noticeable improvement in the dental condition at this time. Recommendations accentuated somewhat the decrease of potentially acid food varieties. Dental examination 6 months later showed interproximal decalcification arrested and no new cavities.

A sample menu which possesses the balance of nutrients used is presented

CHART VII

The Murry and Leonie Guggenheim Dental
Clinic Diet Analysis *

Re: (Patient)	Date:					
Date .						Totals
Acid						
Base						
Milk & equivalents						
Water, juices						
Broth						
Calories						

Comment:

Age Present weight Present calories
Height Required weight Required calories

* This record is on a card 5" wide by 8" long.

in Chart X. It was arranged primarily for comparatively low income groups. Changes may be allowed provided substitutions are made from within the same food classes and there is no marked decrease in caloric value unless forced by dire economic stress. A 20 per cent increase in caloric level may be desirable when possible.

CHART VIII

*The Murry and Leonie Guggenheim Dental Clinic Salivary-Diet Analysis **

Re: (Patient)

Date:

I Findings

A Saliva

pH		
Calcium	mg.	%
Magnesium	"	"
Phosphorus	"	"
Protein	"	"
Cholesterol	"	"
Lipid P	"	"

B Diet characterized by

1.

2.

3.

C Physiology

Copy of Recommendations sent to patient

II Recommendations

Date:

A Diet

1.

2.

3. Take

2½ oz. meat or fish

1 egg

2 slices bread

1 inch cube cheese

½ cup cottage cheese

½ cup cereal or macaroni

or noodles or corn

4 crackers

1 inch slice cake

1 large apple

1 " orange

1 " pear

1 medium banana

Y Portions 1½ peaches or apricots

of 4 large dates

1½ figs

1 medium potato

½ cup vegetable (spinach, beet tops, carrot tops 3 times each week)

X Portion
Only

4. Keep caloric intake at Z. Values of common foods:

Meat	2½ oz.	100
Fish	2½ oz.	100
Egg	1	75
Bread	1 slice	40
Crackers	4	100
Cereal or macaroni or noodles or rice	½ cup	100
Milk	1 cup	150
Cheese	1 inch cube or ½ cup loose	100
Potato	1 medium	100
Vegetable	½ cup of carrots, beets, beans, peas or like	75
	½ cup leafy	15
Fruit	1 large apple, orange, pear	100
	1½ peaches, apricots	100
	4 dates	100
	1½ figs	100
	15 almonds	100

B Return for analysis 5 months after diet instituted. During this time send to Dr. Krasnow record of weight and diet for last week of each month.

C Report to Dr. (dentist) details regarding health.

D Have thorough medical check-up before commencing recommendations.

* The original summary is recorded on a card 5" wide by 8" long.

CHART IX

Case Report: 16 C, 15 years old, healthy, excellent home of good economic status

12/6/35	4/1/36	10/10/36
I Findings:	I Findings:	I Findings:
<i>A Saliva</i>	<i>A Saliva</i>	
pH * 7.1	pH 7.0	
Calcium mg. % 5.3	Calcium mg. % 5.0	
Phosphorus " " 13.2 Tending low	Phosphorus " " 15.5 Increased	
Magnesium " " 0.62 High	Magnesium " " 0.41 Decreased	
Protein " " 300	Protein " " 306	
Cholesterol " " 10.9 High	Cholesterol " " 6.5 Decreased	
Lecithin " " 0.18 Tending high	Lecithin " " 0.14 Decreased	
<i>B Diet</i>	<i>B Diet</i>	
Water, milk low	Milk increased, water low	
Calories somewhat low	Calories increased	
Acid: base 61:45	Acid: base 41:55	
High bread, cake, cereal	Decrease in bread, cereal	
<i>C Dental Report</i>	<i>C Dental Report</i>	<i>C Dental Report</i>
Caries extremely rampant occlusally and interproximally	Apparently no noticeable change	Interproximal decalcification arrested. No new cavities. Enamel texture improved.
II Recommendations:	II Recommendations:	II Recommendations:
Increase milk to 3 glasses	Increase water intake	Continue with previous advice.
Slowly increase water to 8 glasses	Use pahlum instead of other cereal	
Slowly increase vegetables } especially	Substitute fruit for cake dessert	
" " fruits } raw	Use irradiated milk instead of cod liver oil	
Take 2 t cod liver oil		
Decrease slowly bread, cake, etc.		
Keep caloric intake at 1,800		

* The normal ranges are: pH: 7.14 ± 0.04 , calcium: 6.3 ± 0.4 , magnesium: 0.46 ± 0.07 , phosphorus (inorganic phosphate): 15.2 ± 1.0 , protein: 298 ± 17 , lecithin (lipid phosphorus or alcohol-ether soluble phosphorus): 0.13 ± 0.02 , cholesterol, 7.5 ± 0.7 .

SUMMARY AND CONCLUSIONS

Concerted interest and action of physicians, dentists, and laboratorians is the keynote of success in health programs. Dental health is no less a resultant of the health of the organism as a whole than it is itself one of the contributing factors. The balanced diet if interpreted as part of a comprehensive scheme will aid greatly in bringing about scrupulous individual hygiene. To do this it is necessary:

1. To learn the detailed needs of the patient with reference to his entire make-up.
2. To recommend diet changes not in generalities but as specific and calculated prescriptions.
3. To institute frequent check-ups in order to obtain the patient's willing cooperation, for without it every effort will be of no avail.

Thus far, the procedure at the Guggenheim Dental Clinic is resulting in data which apparently indicate a nutritional influence on teeth and point to salivary analysis as an additional objective guide for directing the diet change.

REFERENCES

1. Krasnow, F. Routine Diet and Salivary Analysis at the Guggenheim Dental Clinic. *J. Am. Dental Assoc.*, 25:216 (Feb.), 1938.
2. Krasnow, F. Supplement to *Do You Want Your Baby to Have Good Teeth?* Guggenheim Dental Clinic, May, 1937.
3. Bowes, A. D. *Vitamin Units and Requirements*. Philadelphia Child Health Society, Mar., 1937.
4. Munsell, H. E., and Daniel, E. P. *Vitamin Content of Foods*. U. S. Bureau of Home Economics, Washington, D. C., 1935.
5. Krasnow, F., Hirschfeld, I., and Oblatt, E. B. Presented before the Committee on Scientific Investigation of the American Academy of Periodontology at the Annual Meeting, Atlantic City, N. J., July, 1937.
6. Pearl, R. *Introduction to Medical Biometry and Statistics*. 2nd ed., 1930.

CHART X

Sample Menu for Child of Five Years

Time	Food	Portion	Caloric† Total Value Calories
7:00	Water	¾ glass	
7:15	Cod liver oil	2 tsp.	75
	Cereal (whole seed)	½ cup	52
	Molasses	2 tsp.	60
	Milk (Grade B) *	1 glass	170
10:00	Carrot or beet * (raw twice a week—slowly increasing to greater frequency)	1	15
11:15	Water	¾ glass	
12:00	Potato	1 (medium)	100
	Beet tops (cooked 5 minutes in covered pot with no water added after washing). Green cabbage may be substituted. Raw greens introduced gradually.	⅓ cup	2
	Bread	1 slice	40
	Butter	1 tsp.	40
	Banana *	1	100
	Water	¾ glass	
3:00	Milk	1 glass	170
	Cookies ‡	2	50
6:00	Bean or split pea soup	½ cup	75
	Turnip or similar vegetable in season	⅔ cup	32
	Whole wheat bread (24 hours old)	2 slices	80
	Substituted by:		
	Fish (once a week)	2½ oz.	50
	Spleen, heart, lung meat, once a week *	2½ oz.	170
	Egg (Grade B), twice a week	1	75
	Butter	1 tsp.	40
	Fruit in season	1	75
			1,176

Candy, ice cream, rolls, fresh bread, cake must be excluded from diet. Total cost of diet is approximately 18-22 cents per day. The schedule may be applied to other non-school ages with proper adjustment of calories, etc.

* Extra milk, fruit or fruit juice, beef and liver desirable if income permits.

† Approximate values only.

‡ Three quarters glass of water now or at 4:30.

REFERENCES (Cont.)

7. Krasnow, F., Oblatt, E. B., and Kaplan, N. *J. Dental Res.*, 15:367, 1936.
8. A series of standards in glass cells are prepared by adding to 0.05 c.c. indicator, generally brom thymol blue, 0.2 c.c. buffer mixtures containing graded concentrations of M/15 Na_2HPO_4 and M/15 KH_2PO_4 . Comparison with these determines the pH of the unknown (0.05 c.c. indicator, 0.15 c.c. water adjusted to pH 6.9-7.0, and 0.05 c.c. saliva) in a similar cell. Usually, this procedure is checked with that outlined in the *J. Dental Res.*, 11:573, 1931.
9. Krasnow, F., Karshan, M., and Krejci, L. E. *J. Lab. & Clin. Med.*, 17:1148, 1932.
10. Krasnow, F., and Oblatt, E. B. In preparation for publication.
11. Krasnow, F., Rosen, A. S., and Porosowska, Y. *J. Lab. & Clin. Med.*, 20:1090, 1935.
12. Krasnow, F., and Oblatt, E. B. *J. Dental Res.*, 16:151, 1937.
13. *Idem. ibid.*, 13:239, 1933.
14. Hawkins, H. Dental Decay—What It Is and Means for Its Control. *J. Am. Dental Assn.*, 16:781 (May), 1929.
15. Jones, M. R. Our Changing Concept of an "Adequate" Diet in Relation to Dental Disease. *Dental Cosmos*, 77:535, 651, 747 (June, July, Aug.), 1935.

Practical Procedures in School Health Service^{*†}

DOROTHY B. NYSWANDER, PH.D.

Director of the School Health Study, Committee on Neighborhood Development, New York, N. Y.

HOW does an executive of any organization, public or private, find out whether his department is doing an effective job? This is a practical inquiry. Complacency and self-congratulation have little place in modern administrative jobs. The administrator must know to what degree he is successfully reaching his objectives. The question is—how to make the evaluation.

If the organization is large the executive has many departments. Each of these during the course of time has built up files filled with executive orders, statements of policy, bulletins, and manuals. These materials, each in its own special time, met a certain need. Many of these needs, however, belong to the past, for new concepts, new theories of procedures, new techniques, and new social forces have been introduced into the picture.

Besides the handicap of outmoded regulations there is the handicap of the attitudes of the staff for whom these regulations have become "sacred cows." Often, unfortunately, the "sa-

cred cows" of the various departments are tethered in widely separated fields. It becomes administratively difficult and expensive to give them the care they constantly need for survival. The executive of the division cannot keep watch over them. It is impossible for him to see that their services are no longer valuable and that their maintenance is depriving his modern organization of the sustenance and energy necessary to do the job.

He knows that a well trained staff and good physical equipment make for effective service. The executive in the field of education is aware, however, that good teaching is not synonymous with authors of textbooks or marble halls and stadiums. Nor is superior performance in public health necessarily associated with high-powered publicity, expensive clinical equipment, elaborate statistical records, or vast numbers of personnel. The test of an organization's efficiency lies in its total effect upon the end product. In education and public health the test lies in the degree to which changes in a positive direction have been made in the behavior of people.

If the administrator feels that his department is not effecting such changes, he wants to know why. Is it because of poorly trained personnel, lack of personnel, lack of facilities, or

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

† This study is sponsored by the Department of Health and the Department of Education. Its direction and administration are under the School Health Study Committee of the Committee on Neighborhood Health Development.

because the mechanics of the administrative system itself are so permeated with tradition and imperfections that neither personnel nor facilities can function?

Consider now the specific problem of investigating the effectiveness of the school health service. (For our purposes it matters little whether that service is furnished by the department of health or the department of education.) The administrator responsible for the service is confronted by the fact that he has at least five professional groups involved, each under its own professional leadership. These are the school physicians, the school nurses, the clinic personnel, the teachers, and the private physicians. Where shall he start?

Several courses are open. He may call in an expert to make a survey. He may use the School Hygiene section of the A.P.H.A. *Appraisal Form* to determine the degree to which the service is meeting certain standards. He may make a statistical comparison between the school health activities of his city and those of other cities. He may ask his supervisors to give him data from which new policies may be evolved. Any one of these methods gives the administrator needed information and is certainly far better than making no attempt at self analysis. They have, however, serious weaknesses.

First of all, the use of any of these methods fails to go below the surface of operations in the school health field.

Second, the validity of oral or written reports obtained from the supervisory staff is questionable. The reports are vitiated by complex psychological factors, common in this situation, such as (1) the desire to make a good impression; (2) the belief that the service actually is functioning as represented although no check has been made; (3) "wish ful-

fillment" which operates in such a way that desiring a given result and stating it as having been accomplished become identical in the mind of the person questioned; (4) "defense mechanisms" whose automatic functioning serves to preserve the *status quo* and to keep the "sacred cows" unharmed.

A third weakness lies in the unreliability and lack of usefulness of certain statistics in the school health field. Studies by the American Child Health Association show that physicians markedly disagree in their diagnosis of tonsil defects. The number of malnutrition cases found depends on the procedures used in examination and on the attitudes of the medical director. Figures on dental defects and their corrections are usually useless. Only when the original recordings are the result of a careful dental examination, and each child is seen repeatedly during a year can a true picture be obtained of the service being rendered. Even when the statistics are reliable they may not give the administrator the desired information.

The director of a division of school nursing may be interested in the average number of home visits made by a nurse during a given period, but she and the administrator rightfully raise the question "How valuable in changing health behavior were these visits?" Statistics do not answer this question. Statistics may show that a school physician examines 15 children or 50 during a morning. Neither figure gives the medical director or the administrator insight into the value of the medical services rendered or the type of educational job done with teacher, nurse, and parent in getting the child on the pathway to correction. In other words the statistics usually obtained, although useful for general administrative purposes, fail to reveal either the quality of work done or the specific places where the complex administra-

tive procedures fail to function effectively.

There is, however, another method available to the administrator, one that will give him information basic to developing a school health service in which medical, nursing, and educational staff can carry out the best modern theory and practices known in the school health field. This, for the lack of a better name, may be called the method of "administrative research." It is administrative in that it concerns itself only with problems whose solutions have direct bearing on the functioning of the service. It is research in that the methods employed in solving the problems are frankly experimental and that recommendations made to the administrator are outcomes of problems discovered, analyzed, and given trial in the field.

The larger the organization the more important it is that someone capable of independent and impartial judgment be detailed, not in the central office, but on the firing line to observe what is actually taking place, to sense the gaps and the impractical. Here is the place to work out smooth functioning. The administrator—whether director or supervisor—is usually pretty well occupied in keeping the engine running. He has neither the time nor the opportunity to delve or to cut and try. These opportunities for administrative research within the growing organization are believed to have practical values that equal the demonstrations of new activities.

This "administrative research" method is being tested at the present time in New York City for its effectiveness in aiding the Department of Health and the Department of Education to evaluate the present school health service and to develop a better one. One health district has been designated as the experimental area for this purpose. Here studies are

made, procedures are put on trial, and results are evaluated. The assistant superintendent of education for the area, the director of health education, the directors of the nursing and school hygiene bureaus, the director of district health administration and their respective field supervisors act in the capacity of advisers and censors. They suggest or approve problems to be studied; they make administrative shifts in procedures and policies that the experimental work may proceed; they consider the significance of the results of the experiments and, when conclusive, incorporate them in remaking city-wide policies. The entire value of the study depends upon the degree to which individual administrators of the divisions of the service are given aid in solving their own administrative problems.

This study in "administrative research" has been planned for a period of 4 years. In a school health service of the proportions of New York City this period is not long enough in which to explore and test the many phases of the work. One year of the 4 has passed. Examples of the problems studied and recommendations made during this period will serve to give an idea of the types of services this approach affords.

To learn, first of all, how existing school health records were being used was the first problem of the study. The monograph, "Physical Defects—The Pathway to Correction,"¹ states that "all health records must be vital." By this is meant, records which are accurate, cumulative, and subject to interpretation by teachers and nurses. Present and future medical attention for any child depends on such records. So does the much talked of rapport between teacher and nurse, rapport between nurse and parent, and between school physician and private physician. Poor records and lack of records mean

poor service and lack of coördinated service.

The exploratory work on the problem of records was confined to one large school in the experimental area. Samples were taken of all available health and medical records for the following grades—kindergarten, 2nd, 5th and 7th. The analysis of the records revealed answers to the questions: (1) How complete are the medical files for children now in school? (2) Is the system now being used efficient in transferring school medical records from school to school for the constantly moving school population? (3) Do teachers and nurses in their separate reports indicate that they individually or together are following up defects for the same children? (4) Are the dental, eye, and cardiac clinical records entered on the regular school health record? (5) What use is made by the medical staff of teachers' written observations or reports on health conditions? (6) What use is made by the teachers of the medical records kept by the school medical staff? (7) To what degree do the medical cards give *differentiated* or *individualized* recommendations as to the "follow-up" procedures to be used? (8) Are the entries on the cards readable and understandable by nurse and teacher?

It had been assumed that records followed a child from one school to another when he moved. Actually, it was discovered on investigation that a surprisingly large number of record cards did not move on but died in a terminated file in the last school attended. And in some schools from 30 to 50 per cent of the pupils move annually. This situation called for a simple yet laborious job of revamping the files for ready reference and devising a practical plan for moving cards along with the children. This involved

- (1) providing a cumulative health

- record card for every child, which would go with him into the secondary schools;
- (2) instituting a more precise and accurate filing system of medical cards so that teachers may have available at any time the medical records for their grades;
- (3) sending the medical cards at the beginning and end of each term to the classroom teacher that she may be aware of the health problems known to physician and nurse, and that she may note on the card the grade and room to which the child is being transferred.

Serious lack of agreement in the knowledge of defects between teacher and nurse was revealed. Independent action was being taken on the same child. An experimental study was started immediately to determine the best way to coördinate this knowledge. The Department of Education in New York City has for many years asked its teachers to report twice yearly concerning the physical defects of the children. This report is made on a Health Day Sheet. In the experimental school this Health Day Sheet was changed so that teachers, instead of reporting *diagnoses* of defects, reported on the presence of *behavior symptoms related to health*. Pediatricians believed these symptoms would furnish important case history data to the physician making the diagnosis. To evaluate the teacher-references on this new basis and to test the value of the individual symptoms reported by the teacher became a major project. Eight classes comprising 300 children were selected for the evaluation. The results showed that teachers did not "swamp" the medical office with children. They referred children for medical attention who needed it. Only 10 per cent of those referred were found by the physician to have no defects. The error of reference lies in the cases *not referred* for medical attention. Of the 100 children in this

group 25 were considered by the examining physician to have some defect meriting immediate attention. Further checking during this next year will show whether or not the defects of these 25 children would be lost from sight altogether by this reference method or whether they would come to attention later through referrals by subsequent teachers.

The experimental evaluation showed too the weaknesses of the various symptoms on the Health Day Sheet and indicated specifically where stress must be placed in developing a new Health Day Sheet and in educating teachers to its use.

The study had less objective results but equally important ones. It showed that in using the teacher as a primary screen, (1) knowledge and reports of defects by teachers and medical staff become identical; (2) the physician has a personal professional interest in the child examined because he feels that a *need* for the examination has been expressed; (3) an avenue is opened wide by means of which the school physician and the school nurse may, through their subsequent conferences with the teacher, instruct her in making more valid health observations of her children, inform her as to the recommendations made to the parent concerning each defect; and gain her coöperation. In addition, these same conferences serve the purpose of bringing to the medical staff the instruction it needs in becoming aware of the emotional, social, and educational life of the child. Such information is necessary if the school health service is to meet the objective of really educating child and parents. This objective must not be neglected nor ignored.

Plans for next year call for an extension of these procedures with the new Health Day Sheet to 7 other schools differing widely in economic status. Each of these schools offers

different administrative problems affecting the objective of bringing the teachers and medical staff into a close working relationship. Not until such testing is done can recommendations for administrative changes be made.

Minor investigations were made of the efficacy of various notes embodying requests to parents concerning the child's health. It is generally agreed that placing a child, when possible, under the supervision of the family physician is a desirable objective of the school medical service. In the usual program the administrator formulates a letter urging the parents to have the child examined by the family physician. This letter may or may not be successful. Experimental work with different types of letters showed that whereas 15 per cent of the parents complied with the request for one type of letter, 65 per cent complied with another type. Similarly a good health service implies that the presence of the parents is desirable at all medical examinations given in the school; it further assumes that in many situations parent-nurse conferences in school are more satisfactory than nurse home visits. After trying out several types of notes to parents urging them to be present at the examination or to come to the school for a conference, two were selected. One of them brought 50 per cent of the parents to the school for the examination; the other succeeded in bringing 75 per cent of those not attending the examination to the school for conferences. Thus, with approximately 85 per cent of the children examined in school, immediate contacts were made with the parent in initiating remedial work for the child.

It has been assumed that certain routines when followed by a dental hygienist bring results. No measures of the amount of effort to achieve these results have been made in earlier studies. In order to estimate this

effort, 200 7th grade children were selected for a study. The following routines were carried out in the order given. First the child's teeth were examined and a notice was sent to the parents; the child was then seen by the dental hygienist 3 times at regular intervals to ascertain what was being done; next a special request was sent to the parents urging them to come to the school for a conference; finally, the child was referred to the assistant principal. Any child placed under dental care at any one stage of the routine was naturally not carried through the other stages. Detailed records give a measure of the amount of effort required to get a child's teeth corrected or under treatment. The study gives, too, an index of the problems encountered with children who failed to place themselves under treatment even when all of the above "follow-up" technics were employed.

A school health program always includes "follow-up" procedures. These may be of several types, such as conferences with parents at school, home visits, notes sent home, and instructing and re-checking the child in school. How effective is any of these methods for a special type of defect? To answer this question, at the conclusion of the year a study was made of the 2,400 medical records in the experimental school to find out the *types* of "follow-up" work done with parents and child by physician and nurse which had least success in getting medical attention for the child. Considering each defect separately an analysis of the "follow-up" work shows immediately that certain procedures bring few if any results, and that "follow-up" policies must be different for different defects. Experimental work during the

coming year will furnish answers as to what these procedures should be.

Even in the simple problem of getting Mary Smith to the dentist at least 7 people are usually involved—the school physician, the school nurse, the teacher, the two parents, the private dentist, and Mary herself. And the number of interrelationships between these people is many more than 7. It is only when a realistic attitude is taken toward complexities such as these, so that these interrelationships are recognized and appreciated, that Mary Smith will finally get her teeth filled, her glasses re-checked, and eat her breakfast before running to school. To demand efficient functioning of these detailed steps for one Mary Smith may seem too meticulous. It is indispensable for good administration when there are thousands of Mary Smith's.

Certainly, then, the complexities of the school health program suggest that no schema conceived in *a priori* fashion will work satisfactorily when it is put into operation. Here as in other complex problems of social welfare in which many different people work, many different agencies are concerned, many different types of people are to be served, the job calls for developing the program from the ground up, not from the top down. There is room for much more study of what may be called "internal management" within the school health service. This type of activity may be the best means of meeting some of the shafts of criticism that have been directed against the school health service.

REFERENCE

1. *Physical Defects—The Pathway to Correction*. American Child Health Association, 1935.

Education of the Handicapped Child*

BRONSON CROTHERS, M.D.

Children's Hospital, Boston, Mass.

THE term handicap at once suggests disease or disability and tends to establish medical control. On the other hand, education suggests the orderly development of assets, and teachers are necessarily looking at what is left rather than what is gone. There is no possible use in a discussion unless it is recognized that training of doctors is very different from that of teachers and that effective coöperation is dependent on understanding of necessarily divergent attitudes.

For the purpose of this discussion the term handicapped is limited to the group of children with disabilities dependent on damage to the motor machinery of the body; in other words, the group which is frequently referred to as the cripples. This definition leaves out of consideration the blind, the deaf, and those whose disabilities arise from disturbances of mental and emotional equipment.

Everyone of this restricted group comes first under medical scrutiny, so that the doctor's decisions and his attitudes are of enormous importance. It seems to me very clear that the medical attitude at the start is one of the things which influence the whole educational process, and some understanding of it must precede further discussion.

Traditionally the physician tries to

arrive at a clear understanding of the following aspects of a case.

1. The status of the child at the time of examination. Primarily this is expressed in terms of deficit. This insistence upon deficit or disturbance, either anatomical or physiological, is entirely inevitable and correct since it leads to decision as to whether the process causing the difficulty can be arrested or its effects can be corrected. Furthermore, the appraisal of deficit leads to proper classification or "diagnosis."

2. A search for the cause is made. This is the "etiology" of the medical vocabulary.

3. The ordinary course of the disease or the ordinary effect of deficit is then considered in terms of "prognosis."

4. Treatment designed to control an active disease or to ameliorate the disability is finally considered.

On the whole, the doctor is discharging his most obvious responsibility when he has competently appraised and managed deficits. The problem is then frequently handed over to a new group who attempt to develop the remaining assets.

Efficient teamplay between doctors and teachers is possible even under these conditions, if it is possible to arrive at a valid residue by an agreed formula. For instance, it is quite possible to carry on education of a child whose right arm is completely disabled by infantile paralysis. The psychological integrity of the child and the efficiency of the remaining limbs can be assumed. The industrial effectiveness of the assets and liabilities can be appraised and no confusion exists.

The difficulties pile up rapidly, however, when the medical appraisal is

* Read at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

either inadequate or is not easily translated into terms of remaining assets. The doctor must deliberately attempt to add a very difficult section to his formulation. He must, I think, try to define the remaining assets so that the psychological and physiological remainder will be understood by those who are responsible for education.

Fortunately the problem of infantile paralysis lends itself to accurate study. Essentially the disability is due to the subtraction of a certain number of units of motor function from a known total of identical units. The deficit can be calculated and the remainder obtained by the familiar process of subtraction. By development of remaining muscular tissue, by substitution of apparatus for lost fibers or by fixation of joints, a maximal efficiency can be reached. The fact that infantile paralysis is common and that the medical deficit is easily translated into terms of educational assets, leads, I think, to a feeling that the same process can be applied with equal effectiveness all along the line.

There is a second group, fortunately less common, where a disease, in the ordinary sense, is still active. Certain children have, for instance, tuberculosis of joints. Here the motor disability is only one factor. It is impossible to deal with the child on any basis which assumes that the balance-sheet is more than an expression of opinion concerning the immediate status. Obviously the responsibility of the physician is continuous and the teacher is unable to work out long-time plans with any security.

A third group, fortunately still smaller than the last, have remorselessly progressive disease. The child with progressive dystrophy, for example, has constantly decreasing assets. There is not confusion since again the conclusions of the doctor as to increasing deficits are easily understood.

The next group, which is relatively large, is much more difficult to manage. Injuries or disease of the brain, with consequent disturbance of motor control are not uncommon. Cerebral palsy is perhaps as useful a name as any for this group. In general, the cause is a diffuse abnormality of the brain due to various causes of which injury at birth is probably the major one. For obvious reasons it is desirable to ignore in the discussion two major groups—first, those whose intellectual equipment is not adapted to educational procedures, and second, those under continuous medical care because of advancing symptoms.

The children who are relevant suffer, not from isolated abolition of motor function, but from confusion of control of motor function. Obviously a mere process of subtraction will not give us a clean-cut picture, even of the motor deficit. The medical formula in terms of anatomical deficit is complicated. The appraisal of physiological disorder is also difficult. In addition there is almost always an intellectual irregularity or deficit. The duty of the doctor seems to me an arduous one. If endless confusion and frustration are to be avoided he must arrange his material so that his conclusions can be effectively used by parents and teachers. He does not discharge his responsibility until he has indicated the remaining physical and mental assets, suggested a type of training compatible with these assets, and discussed the probable ultimate level of efficiency.

I have no illusions about the difficulties of management of crippled children. Failure of the best known procedures is inevitable in certain cases, but the next step which is being taken in various places is to recognize that the doctors, instead of confining themselves to the appraisal and management of defect, must coöperate

with psychologists, psychiatrists, and teachers in formulating a conception of assets. If they succeed they can then coöperate in the planning of an educational routine which will lead toward an attainable goal.

Two equally confusing and dangerous attitudes are common: The irrepressible optimist sees no limits to the spiritual or intellectual achievement of the crippled child; the almost certain result is frustration and disillusionment if remorseless limitations have been overlooked. The pessimist

who looks with pitiful despair on the poor broken children, is equally deplorable.

Doctors, teachers, and psychologists ought to be able to define liabilities and assets of individual children and to get away from generalizations which are inaccurate and misleading. Until such concerted efforts are carried out in all centers for the care of crippled children, we will have no reliable progress. Inspirational talks arouse interest, but furnish no solid basis for adequate educational planning.

Fatal Accidents in 1937

ONCE again, as the year draws to a close, we scan the national accident record. Once again the verdict is unsatisfactory. This is now clear, even though all the records are not in. Every indication, particularly the index of the National Safety Council, points to a toll of around 104,000 killed in accidents of one kind or another, the highest figure for any year with the single exception of 1936, when, according to the National Safety Council's estimate, the all-time high figure of 111,000 deaths was reached. As compared with this record figure, 1937

showed a recession by more than 6 per cent.

Accident fatalities in the home or in public places (exclusive of motor vehicle fatalities) apparently were lower in 1937 than in 1936. Motor vehicle and occupational accident fatalities, on the other hand, increased.

The ugliest feature of the accident situation was a rise of about 2,000 in the number of motor vehicle fatalities, bringing the total to the unheard of figure of 40,000 deaths in one year, a new high record.—*Statistical Bulletin*, Metropolitan Life Insurance Co., Dec., 1937.

Measurement of Sanitary Ventilation^{*†}

WILLIAM FIRTH WELLS AND MILDRED WEEKS WELLS

Laboratories for the Study of Air-borne Infection, University of Pennsylvania, Philadelphia, Pa.

ABILITY to modify man's environment is not confined to the enhancement of comfort, convenience, or even safety but extends to the prevention of disease and the promotion of health. By supplying pure water and pure food, the sanitary engineer has, in many communities, almost eliminated intestinal infection. Is it unreasonable to hope that, when air-borne infection is better understood, diseases conveyed through the respiratory tract may likewise be reduced through the provision of pure air supplies?

Experimental evidence has accumulated during the past few years which brings this possibility within the realm of the engineer.¹ It has been shown:

1. During coughing and sneezing, minute droplets containing microorganisms from infected surfaces may be ejected into the air.²

2. Most of these droplets are sufficiently small to evaporate before they can settle to the ground, leaving suspended in the air minute residues.³

3. These nuclei, in which the microorganisms remain viable for considerable periods, may drift in air currents as would particles of cigarette smoke.⁴

4. The air breathed commonly by the various persons congregated in a room or

other enclosed space can thereby transfer these organisms from one person to another and plant them upon the susceptible tissues of the respiratory tract.¹

The engineer may, therefore, proceed upon the assumption that drifting particles arising from common occupancy of enclosed spaces constitute a hygienic hazard, which may be reduced through the elimination of the microorganisms thus suspended in air. Where individual supplies of air can be furnished to each person, the problem of air-borne infection disappears. Blackfan and Yaglou⁵ report spectacular reduction in acute and chronic infection of premature infants, chiefly respiratory, by the installation of a separate air-conditioned supply to wards for premature infants. The Chapple incubator⁶ by providing an individual supply of pure outside air to each infant attains this theoretical ideal, for even the nurse is excluded from the child's atmosphere. Whether the principle of the individual air supply can be profitably prolonged beyond the premature into the normal life span is a problem of hygiene as well as engineering. The practicability of a cabinet cubicle for infant care in nurseries is now being studied by Dr. Chapple in the Laboratory of Air Hygiene at the Children's Hospital, Philadelphia.

In general, however, the engineer must provide for common occupancy of enclosed spaces. The magnitude

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

† This study is supported by a grant from the Commonwealth Fund to the University of Pennsylvania for investigations on air-borne infection with the laboratories in the Department of Bacteriology, the Children's Hospital, and the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis.

of this hazard depends upon the degree of confinement of the air common to many persons, or rather upon the concentration of the contaminating nuclei, which varies directly with the number of persons occupying a given volume of air (and their specific infectivity), and inversely with the dilution either with pure air from without or with any other equivalent means of elimination of the microorganisms, such as precipitation, filtration, washing, physical or chemical disinfection. As Colvin has said,

The fundamental factors in prevention or control of droplet infection become evident. Dilution of the droplets by air space or change of air provide the barrier, *i.e.*, proper space for each one, especially in sleeping, and proper ventilation.⁷

Sanitary ventilation may, therefore, be defined as the rate at which microorganisms are vented; or as the proportional air replacement which would remove the equivalent number of micro-

organisms eliminated by any other means.

METHODS OF MEASURE OF EQUIVALENT VENTILATION

With the modern technic of sanitary air analysis,⁸ the equivalent air replacement can be simply determined. A diluted culture of the test organism is thrown into the air by an atomizer (Figure I) which may be designated the infector. Following the instantaneous evaporation of the droplets, the contained bacteria remain suspended in the air like an invisible smoke. The bacterial concentration may be determined by the air centrifuge,⁹ which represents a mechanical infectee. The specific technic is contingent upon the dimensions involved.

B. coli is a convenient test organism: it is harmless; it is easy to culture, and we have in eosin-methylene blue agar a selective medium in which *B. coli* grows readily but which is in-

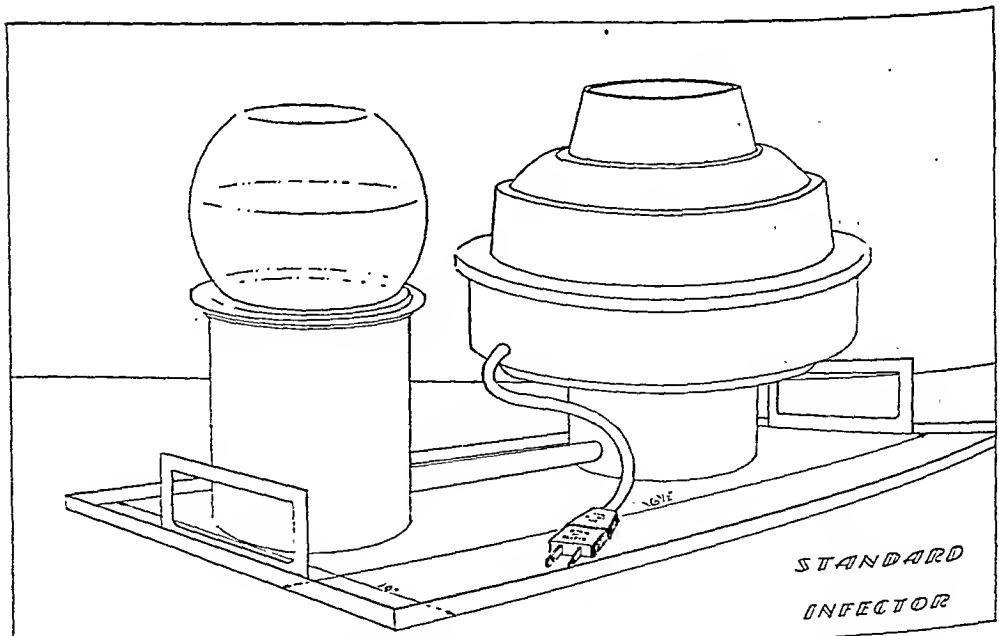


FIGURE I—Atomizer adapted from special assembly of humidifier by William Feldermann, American Gas Accumulator Co., Elizabeth, N. J.

hibitive to other organisms in the air (in these tests, contaminants); on this medium the colonies are readily counted¹⁰; it grows singly; it is not a normal inhabitant of the air, and one can be sure that the organisms recovered by the centrifuge were put there by the atomizer.

It becomes possible, therefore, by a suitable technic to measure directly the degree to which an infector at any point in a confined space infects an infectee at any other point under given conditions of ventilation. By comparing these measurements under varying conditions of ventilation we are provided with a quantitative instrument for measuring sanitary ventilation as defined above.

Two general methods are described which make it possible to study specifically the conditions which facilitate or impede the passage of infection from infector to infectee and to determine the efficacy of any means for preventing or reducing such passage of microorganisms. These measurements may be compared to the effect produced by removing from the confined space a given proportion of the volume of air in a chosen unit of time, the removal rate giving a unit of equivalent ventilation. Replacement of the confined air by outside air or air from other parts of the building by natural or artificial means, or removal or destruction of microorganisms within the air, all can be expressed in terms of equivalent ventilation.

I. Method of the Die-away—The simplest method for determining the ventilation rate is to build up within a room a desired bacterial concentration by atomizing a diluted liquid culture of the test organism; the atomizer is then turned off and consecutive samples of the air are taken.⁸ Since with uniform ventilation the number of organisms removed in a small unit of time is proportional to the number present,

that is:

$$dN = -KNdt$$

it follows that

$$\log_e \frac{N}{N_0} = -Kt \text{ and } N = N_0 e^{-Kt}$$

The difference between the logarithms of two counts divided by the elapsed time between the two samples gives the value K . The value K as thus determined by using natural logarithms becomes the rate at which microorganisms are being vented and therefore a measure of sanitary ventilation. If we express time in minutes K then represents the proportional air replacement per minute which would vent an equal number of organisms and therefore becomes a unit of equivalent ventilation. Multiplied by 60, the equivalent turnovers per hour as understood by the ventilating engineer can be ascertained.

Since K is more conveniently calculated by common logarithms, the K so determined must be multiplied by 2.3 to obtain the equivalent ventilation as given above, or the K is multiplied by 138 (2.3×60) to obtain the turnovers per hour. The working rule for obtaining equivalent sanitary ventilation becomes: *the number of over-turns per hour is equal to 138 times the difference in the logarithms of two counts divided by the elapsed time in minutes between the two counts.*

II. Method of Equilibrium—If an infector contributes bacteria to the air at a uniform and constant rate, the number within the space will increase until the number removed will equal the number added in a unit of time. If the number removed, as given by the *method of the die-away*, is a constant proportion of the number present, it follows that when the rate of removal multiplied by the number present equals the rate of addition, equilibrium will have been reached. The concen-

TABLE I

Laboratory of Sanitary Ventilation for the Study of Air-borne Infection
Routine Test of Sanitary Ventilation, 1/10/38

Infecter on continuously from 3:27 P.M. to 4:27 P.M., atomizing a 22 hour culture of *B. coli*, diluted to 5 per cent

	Tube	Time	Temp. ° F.	R.H. %	Logarithm of					Over- turns per Hour
					Counts	C/K_1	K_1/K	K_1/K	K_1	
<i>Equilibrium:</i> 12" quartz mercury Geissler tube on at 3:32 P.M., center of room, reflected upward above eye level	I	3:33-38	69.0	47	3.7163	C/K_1	K_1/K	K_1/K	K_1	
	II	3:39-44	69.5	48	3.6379	3.3651 (asymptote)	.9859	9.7	.8410	116
	III	3:45-50	69.5	48	3.5729					
<i>Equilibrium:</i> therapeutic carbon arc projector,* screened through Corex D glass, throwing beam across room	IV	3:52-57	69.5	50	3.6091	C/K_2	K_2/K	K_2/K	K_2	
	V	3:58-03	69.5	52	3.8587	4.0840	.2670	1.9	.1647	23
	VI	4:04-09	69.5	52	4.0840					
<i>Equilibrium:</i> lights off	VII	4:10-15	69.5	52	4.2781	C/K		C/K	C	
	VIII	4:16-21	69.5	53	4.3160	4.3510 (asymptote)		22,450	.1850	
	IX	4:22-27	70.0	54	4.3338					
<i>Die-Away:</i> lights off, infecter off	X	4:28-33	70.5	52	4.0700	K			K	
	XI	4:34-39	70.5	52	3.4035	.1111			0867	11.3
	XII	4:40-45	70.5	52	3.0298	.0623				
					Av. .0867					

Test room: 20' x 20' x 12'; 3 windows on one side, 1 on another; 3 doors on other two sides—all closed

Atomizer placed near center of 3 window side, 8' from floor; heating radiators beneath created an up-draft; ordinary home electric fan blowing toward atomizer created a cross-draft

Centrifuge at opposite side of room from atomizer, 3' from floor

* Note: Same lamp without Corex D filter gave in another test 537 overturns per hour

tration in the room when equilibrium is reached, therefore, is equal to C/K where C is the addition rate and K is the removal rate (given by the method of die-away).

If a ventilating factor is changed, then the new equilibrium will adjust itself in accordance with this equation, and by dividing the number per unit volume obtained under the two conditions of equilibrium, the addition factor cancels and the removal rates will vary inversely with the equilibria reached. If any removal rate has been determined by the die-away curve, removal rates obtained with other ventilating factors may be readily compared by the ratios between the equilibria obtained by test.

For example, under three consecutive conditions of ventilation we obtain equilibria C/K , C/K_1 , and C/K_2 from which K_1/K and K_2/K can be obtained by division. These ratios multiplied by K , as determined by the method of the die-away, give the values of K_1 and K_2 .

(In the sample test, the elapsed time between samples is 6 minutes. The counts are conveniently computed into logarithms as given in the record. The difference between logs X and XI , or XI and XII , divided by 6 gives K . Subtracting from the log of C/K , log C/K_1 and log C/K_2 gives log K_1/K and log K_2/K , from which K_1/K and K_2/K are obtained. Multiplying by K , as determined from the die-away, gives K_1 and K_2 . Multiplying K , K_1 , and K_2 by 133 gives overturns per hour.)

The time required for an equilibrium to be reached is theoretically infinite but under practical conditions can usually be obtained within a reasonable period. It is possible.

however, to express the number obtaining at any time after the commencement of the addition by the formula:

$$P = \frac{C}{K} (1 - e^{-Kt})$$

which reduces at zero time to zero and approaches an asymptote C/K as the time is prolonged to infinity. It will be further seen that the greater the value of K , the more rapidly does the number approach this asymptote.

It may be inconvenient to solve for the value of C/K by determining the shape of this curve, and yet the time required to approach the practical equilibrium may be longer than desired in making a test. The accurate determination of three points at equal intervals, as by taking three consecutive samples, permits the computation of C/K . Bacteriologic analyses ordinarily are not sufficiently precise to locate the asymptote accurately, but this relationship assists in the graphic location within the accuracy demanded in practical tests. It is characteristic of this curve, whether increasing or decreasing, that the product of the extremes minus the square of the mean divided by the sum of the extremes minus twice the mean gives the asymptote C/K . Thus if x , y and z are tube counts of three consecutive air samples taken with equal intervals between (see sample test), then:

$$\frac{xz - y^2}{x + z - 2y} = \frac{C}{K}$$

(In the example, counts I, II and III can be substituted for x , y and z , and so also can counts VII, VIII and IX. When, however, the formula is applied to counts IV, V and VI, the deviation of the count of one tube destroys the natural sequence for the solution is found by inspection to be unreasonable. The equilibrium is therefore assumed to be reached with count VI, although a more experienced judgment might apply a graphic correction.)

Because of individual variation in death rate of organisms in the same culture, and other technical factors, the technic must be standardized as far as possible to assure closely comparable results. The dimensions given by this typical test have been found by practical experience to yield reproducible results.

The irradiation of recirculated air constitutes a simple case of bacterial ventilation by means of ultra-violet light. If the efficiency of such ventilation is determined by samples taken within the recirculation system before and after irradiation, the fraction of the bacteria removed represents the fraction of the recirculated air which may be assumed to replace by pure air the contaminated air of the room. Equivalent sanitary ventilation is thus limited by the rate of recirculation. If only 10 per cent of the air is recirculated per minute, the highest equivalent ventilation by any system of purification or by supplying entirely fresh outside air would be 6 turnovers per hour. Compared with the sanitary ventilation obtainable by treatment of the whole volume of air of occupied spaces (discussed under B and C and D) this fractional method of replacement of room air with pure or purified air by mechanical means, hitherto available to the ventilating engineer, is completely out of range. (In the sample test (Table I) a ventilating equivalent of 116 turnovers per hour was easily obtained, and other routine tests could be selected showing several thousand turnovers per hour.)

In special cases, such as railroad cars,* the rate of recirculation may be as high as 20 turnovers per hour, and therefore the irradiation of the recirculated air provides a feasible method of sanitary ventilation, especially since the occupancy load is high and usable space is greatly restricted.

B. Direct Irradiation of Room Air—
In the previous case the change in the room air is given by a percentage reduction of a percentage recirculation.

BACTERIAL VENTILATION BY ULTRA-VIOLET IRRADIATION

A. Irradiation of Recirculated Air—

* A study of the purification by ultra-violet radiation of the recirculated air of railroad cars is being conducted in collaboration with S. M. Anderson, Research Engineer of the B. F. Sturtevant Co., Hyde Park, Mass.

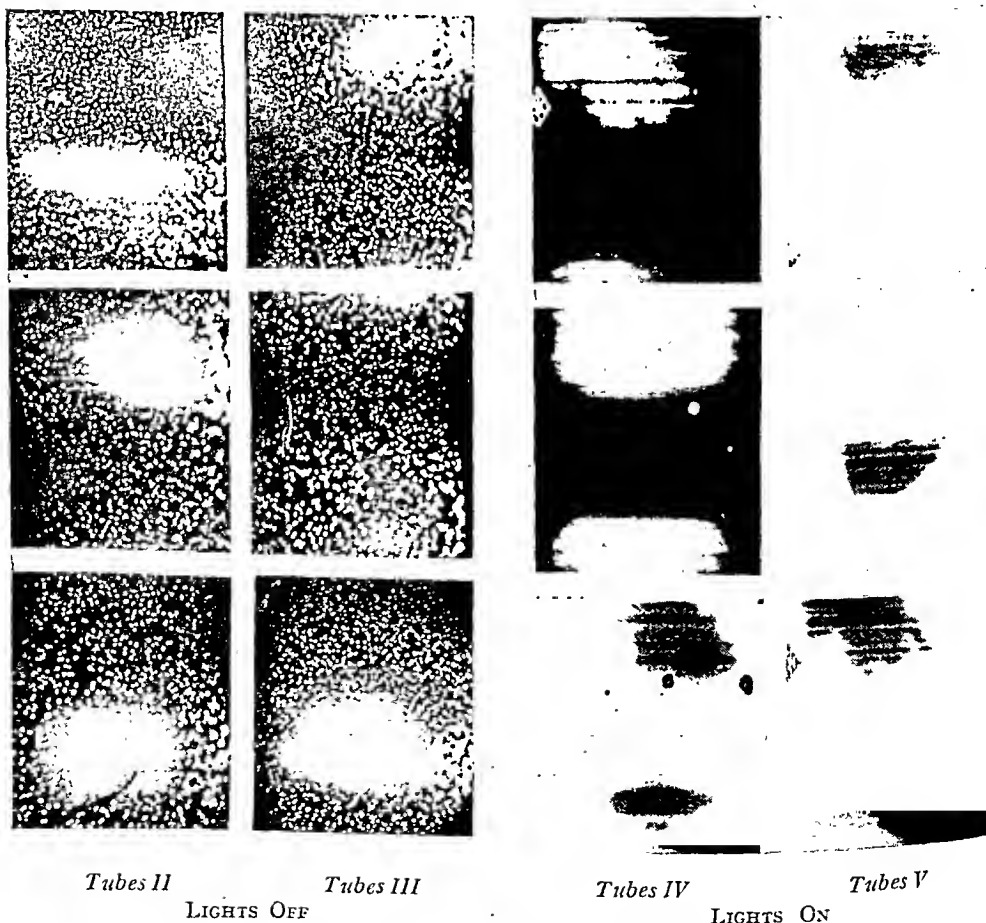
Direct irradiation of the whole room is far more effective in the special instances where the eyes of the occupants can be protected. An operating room furnishes a special instance of such irradiation, since the discipline maintained permits responsible protective measures. Here reflectors containing the burners, installed in the angles where ceiling and walls meet provide general irradiation of the major portion of air in the operating room, and

throw a broad beam of ultra-violet light onto the operating table.*

Such an installation may be tested by placing the infectee in the center of the room at the level of the operating table (this being the critical point of protection); by continuously infecting the air with an infector placed successively in each corner of the room;

* This type of installation has been under test by Dr. Richard Overholt, Department of Thoracic Surgery, New England Deaconess Hospital, Boston, Mass., for about a year.

FIGURE II—Photographic projections of actual centrifuge tubes obtained in routine test on operating room. Tubes represent 10 minute samples with 1 minute interval between. Tubes I (omitted from picture), II and III represent build-up of bacterial concentration without lights, with infector in each of three corners successively. Lights turned on at end of each 3rd sample and off at end of each 5th sample before moving infector to another corner of room. Infector ran continuously throughout test.



and testing each location of the infector with the lights on and the lights off. The ratio of the equilibrium counts obtained with the lights off and the lights on then gives a measure from which the sanitary ventilation attributable to the lights can be calculated. Their power actually determined under such circumstances by the method of equilibrium, appears fantastic when converted into equivalent ventilation units, and can be better illustrated than computed (Figure II).

C. Partial Irradiation — Direct irradiation applies to special cases. The general problem of the sanitary air control of schools, institutions, etc., can be solved by partial irradiation, where the space without the eye zone is directly irradiated. The irradiation of the upper air of a room may be regarded as equivalent to removing the ceiling or ventilating upward instead of by windows if the air circulation could then be comparable to that in a room. The disinfection of the air in the unirradiated zone depends upon air movement through the irradiated space, as well as upon the spatial distribution of the radiation.

Careful design, operation, and regulation, though necessary in all sanitary light installations,* are of particular importance with partial irradiation because efficiency rests primarily upon the relationships established between the irradiated and unirradiated portions of the room. The integrated product of intensity and time of exposure for all the living organisms within the space which determines the number killed,² mathematically predictable in ideal geometric configurations,¹ must be bacteriologically determined in the practical solution of partial irradiation. The routine test illustrates how de-

terminations between different points with lights on and lights off can be converted into equivalent ventilation.

Until opportunities to test buildings specially designed for irradiation become available, experience gained with empirical installations must serve to establish design principles as well as guide in effective regulation.†

D. Light Barriers — Ultra-violet screens or barriers constitute another special application. The air of cubicles‡ separated from the surrounding air of a ward by ultra-violet light screens can be tested either by placing the infector within and the infectee without (representing the protection offered the surrounding ward from a person ill within the cubicle), or by placing the infector without the cubicle and the infectee within (representing the protection offered a person within the cubicle from the surrounding ward). In each instance the bacterial tightness of the light-enclosed space is determined by the method of equilibrium.

In an isolation hospital, where a light barrier is thrown across a corridor to separate two contagious diseases,** the efficiency or bactericidal power of this barrier may be determined directly under the actual ventilating conditions in the corridor. The infector is placed on one side of the barrier and the infectee on the other, samples being taken with the lights on and off. The infector and infectee are then reversed and the test duplicated. Tests made by the method

† Such experimental installations are now being tested at the Children's Hospital, Philadelphia, Pa.; the Germantown Friends' School, Germantown, Pa.; and the Marlboro State Hospital, Marlboro, N. J.

‡ Tests are now being conducted in the Laboratory of Air-borne Infection at the Henry Phipps Institute, Philadelphia, upon cubicle design, in collaboration with C. A. Erikson, of the firm of Schmidt, Garden & Erikson, consulting architect for the Cradle Society, Evanston, Ill.

** Dr. Charles F. McKhann first applied this principle to a corridor in the Isolation Unit of the Children's Hospital, Boston, Mass., and he has observed the results for about 1 year.

* Studies on air disinfection are being conducted at the Laboratory of Sanitary Ventilation, Department of Bacteriology, University of Pennsylvania Medical School.

of equilibrium have shown that light screens can be made practically impervious to bacteria suspended in droplet nuclei and carried by ordinary ventilating currents.

SUMMARY

These examples serve to illustrate the manner in which the essential technic can be adapted to special problems. In each instance the measure of equivalent ventilation between any two points can be expressed in terms of the proportional pure air replacement throughout the whole room which would bring about the same reduction in the infection transferred from one to the other point.

CONCLUSIONS

In attempting to define bacterial ventilation in specific terms, the engineer is entitled to assume that the value of C , as indicative of the number of persons per given volume of air space represents a degree of potential infection, and to regard the value of K as indicative of the rate of reduction in this potential hazard resulting from the instruments of ventilation, and the ratio C/K an index of the relative hazard in one room as compared with another. Whether or not such an index can be correlated with epidemiological experience remains a major problem of sanitary science. Installations of ultra-violet lamps have been set up

under competent and rigid medical control in order to determine the value of such measures under specific conditions, and until such conclusions are available to the engineer, he can only be guided by the bacteriological evidence. When indices of sanitary ventilation are correlated with the epidemiological data on a sufficiently large scale, the results should guide the engineer to the proper design of ventilating instruments. This may lead to a realization of our present hope that if the sanitary quality of air is controlled, reduction of respiratory disease will be accomplished.

REFERENCES

1. Wells, W. F., and Wells, M. W. Air-borne infection. *J.A.M.A.*, 107:1698 and 1805, 1936.
2. Wells, W. F. Air-borne Infection and Sanitary Air Control. *J. Indust. Hyg.*, 17:253, 1935.
3. Wells, W. F. On Air-borne Infection. II. Droplets and Droplet Nuclei. *Am. J. Hyg.*, 20:611, 1934.
4. Wells, W. F., and Stone, W. R. On Air-borne Infection. III. Viability of Droplet Nuclei. *Am. J. Hyg.*, 20:619, 1934.
5. Blackfan, K. D., and Yaglou, C. P. The Premature Infant. *Am. J. Dis. Child.*, 46:1175, 1933.
6. Chapple, C. C. An Incubator for Infants. *Am J. Obst.* In press.
7. Colvin, M. G. Air Dissemination of Bacteriophage in Relation to Air-borne Infection. *Am. J. Hyg.*, 15:247, 1932.
8. A Bacteriological Method of Sanitary Air Analysis. Report of Sub-committee on Bacteriological Procedures in Air Analysis. *Year Book, 1936-1937*, Supplement to *A.J.P.H.*, 27, 3 (Mar.), 1937.
9. Wells, W. F. On Air-borne Infection. I. Apparatus for the Study of the Bacterial Behavior of Air. *A.J.P.H.*, 23:58, 1933.
10. The technic of counting and recording colonies will be described in a forthcoming paper.

Basic Principles of Healthful Housing*

Preliminary Report

COMMITTEE ON THE HYGIENE OF HOUSING

AMERICAN PUBLIC HEALTH ASSOCIATION

C.-E. A. WINSLOW, *Chairman*

FREDERICK J. ADAMS

ROLLO H. BRITTEN

F. STUART CHAPIN

JOEL I. CONNOLLY

ROBERT L. DAVISON

EARLE S. DRAPER

JAMES FORD

J. ANDRÉ FOUILHOUX

GRETA GRAY

JAMES E. IVES

MORTON G. LLOYD

B. M. PETTIT

GEORGE C. RUHLAND

H. A. WHITTAKER

ALLAN A. TWICHELL, *Technical Secretary*

PHILIP E. NELBACH, *Field Secretary*

* This Report has not been approved as a standard publication by the American Public Health Association's Committee on Research and Standards but has been endorsed by that Committee for release so that it may be made available for study.

CONTENTS

	PAGE
Introductory Statement	354
<i>Section</i>	
A. Fundamental Physiological Needs	
1. Maintenance of a thermal environment which will avoid undue heat loss from the human body	355
2. Maintenance of a thermal environment which will permit adequate heat loss from the human body	356
3. Provision of an atmosphere of reasonable chemical purity	357
4. Provision of adequate daylight illumination and avoidance of undue daylight glare	357
5. Provision for admission of direct sunlight	358
6. Provision of adequate artificial illumination and avoidance of glare	358
7. Protection against excessive noise	359
8. Provision of adequate space for exercise and for the play of children	359
B. Fundamental Psychological Needs	
9. Provision of adequate privacy for the individual	360
10. Provision of opportunities for normal family life	361
11. Provision of opportunities for normal community life	362
12. Provision of facilities which make possible the performance of the tasks of the household without undue physical and mental fatigue	363
13. Provision of facilities for maintenance of cleanliness of the dwelling and of the person	364
14. Provision of possibilities for reasonable esthetic satisfaction in the home and its surroundings	364
15. Concordance with prevailing social standards of the local community	364
C. Protection Against Contagion	
16. Provision of a water supply of safe sanitary quality, available to the dwelling	365
17. Protection of the water supply system against pollution within the dwelling	365
18. Provision of toilet facilities of such a character as to minimize the danger of transmitting disease	365
19. Protection against sewage contamination of the interior surfaces of the dwelling	366
20. Avoidance of insanitary conditions in the vicinity of the dwelling	367
21. Exclusion of vermin which may play a part in the transmission of disease	367
22. Provision of facilities for keeping milk and food undecomposed	368
23. Provision of sufficient space in sleeping-rooms to minimize the danger of contact infection	368

PAGE

D. Protection Against Accidents

24. Erection of the dwelling with such materials and methods of construction as to minimize danger of accidents due to collapse of any part of the structure	368
25. Control of conditions likely to cause fires or to promote their spread	369
26. Provision of adequate facilities for escape in case of fire . .	370
27. Protection against danger of electrical shocks and burns . .	370
28. Protection against gas poisonings	371
29. Protection against falls and other mechanical injuries in the home	371
30. Protection of the neighborhood against the hazards of automobile traffic	372

INTRODUCTORY STATEMENT

SHELTER is one of the three fundamental needs of human existence. No housing program can be sound unless the shelter it provides is healthful. It was this latter consideration which led the American Public Health Association to organize a Committee on the Hygiene of Housing, to serve also as the organ of coöperation for the United States with the Housing Commission of the Health Organization of the League of Nations.

In beginning the work of this committee it has seemed essential to formulate the basic health needs which housing should subserve. This report is a preliminary attempt at such a formulation.

This report consists of 30 basic Principles, with Specific Requirements and suggested Methods of Attainment for each. The Principles and Specific Requirements are believed to be fundamental minima required for the promotion of physical, mental, and social health, essential in low cost as well as high cost housing, on the farm as well as in the city tenement. Under Methods of Attainment are suggested the more important means by which these objectives can be achieved, without excluding alternative means of attaining the same ends, and without attempting exhaustive treatment of the many technical points which are covered elsewhere in the literature of housing and construction methods.

In view of the present status of the

housing program in the United States, particular emphasis has been placed, in drafting these Methods of Attainment, on the needs of new urban construction. The Principles and Specific Requirements, however, are equally valid as a guide for new rural construction or for the appraisal of older housing whether rural or urban, inasmuch as they are based on fundamental biological requirements.

Many of the objectives stated involve problems of management as well as of planning and construction. This must be the case if we are concerned with results achieved, and not merely with requirements on paper. Under the hopeful policy envisaged by the new public housing program—that of continuing management responsibility by local housing authorities—it should be possible to approve given types of housing facilities only for stated conditions of use and occupancy, just as elevators have long been licensed to carry only a certain number of persons, or warehouses a given floor-load.

The report here presented is a preliminary one. In the text are noted points which require further investigation. The committee is conducting research on certain of these points and will follow the findings of other agencies in the field, toward the end that the present report may be revised and amplified in the light of accumulating knowledge.

C.-E. A. WINSLOW, DR.P.H., *Chairman,*
ALLAN A. TWICHELL, *Technical Secretary,*
Committee on the Hygiene of Housing

SECTION A

FUNDAMENTAL PHYSIOLOGICAL NEEDS

Principle 1. Maintenance of a thermal environment which will avoid undue heat loss from the human body

a. *Specific Requirements*—The chief variables controlling heat loss from the human body in a dwelling (since neither air movement nor humidity is likely to be considerable) are air temperature and the mean radiant temperature of surrounding surfaces (walls, windows, radiators, human bodies, open fires). The combined effect of air temperature and mean radiant (or wall) temperature is defined as "operative temperature." For ordinary dwelling conditions, operative temperature may be taken as approximately the mean between air temperature and wall temperature. For the normally vigorous person, normally clothed, and at rest, an operative temperature of 65° F. is the minimum. In all regularly occupied rooms this temperature should be provided at knee-height, 18 inches, in order to prevent chilling of the legs and feet. Air temperature may be increased or decreased in order to compensate for deviations of mean radiant temperature above or below air temperature.

In rooms occupied by persons of sub-normal vitality, operative temperatures must be higher than 65° F. Since dwellings are designed for occupancy by old people and children, the heating system should be able to provide an operative temperature of 70° F. at knee-height under ordinary winter conditions. Such a temperature is, however, unduly high for the normal adult and should not ordinarily be maintained.

Considerable vertical differentials of air temperatures are highly undesirable, since they involve waste of fuel (from increased heat loss through the upper areas of the room), and since they not only produce local chilling of the lower extremities, but also increase convection currents. From this standpoint radiant heating has special advantages, since it maintains a very low floor-to-ceiling differential. With ideal radiant heating, knee-height temperatures and 5 foot temperatures would be almost identical. With ordinary free-standing radiators a knee-height temperature of 70° F. would ordinarily imply a 5 foot temperature of 76° and a ceiling temperature of 80° F.

b. *Methods of Attainment*—The practical measures to be taken in housing design to meet these needs must, of course, depend upon climate, but it should be possible to reach the limiting temperature of 70° F. at knee-height under ordinary minimum winter conditions for the locality concerned. The usual figure for outside temperature taken by engineers as a basis for their computations is 15° F. above the lowest recorded temperature for a 10 year period.

The heating equipment provided will also, of course, be closely related to the insulation of the building. Superior types of construction, weather-stripping and the use of double windows, and the use of insulating materials in ceilings and walls may, in cold climates, reduce heating costs by 50 per cent or more. Such insulating capacity should, therefore, be provided as is justified by fuel economy balanced against ad-

ditional construction costs. The balancing of these factors is a problem deserving special study.

For low-rent housing in one- or two-story dwellings, the circulating heater type of stove will generally prove the most economical heating equipment. For apartments, and perhaps for large groups of one- and two-family houses, steam heat from a central plant should prove equally economical. Central heating cannot wisely be replaced by stoves in the multi-story dwelling because of fire hazard and the problems of fuel storage and ash disposal.

For more expensive installations, hot water heating has certain advantages. Indirect heating by hot air may also be employed. Where indirect heating involves considerable air change, permissible lower limits of temperature may have to be raised (to balance increased rates of convection loss from the body).

The possibilities of low temperature radiant heating by steam or hot water or, where power rates are low, by electricity, should be given careful consideration.

Flooring materials of high heat conducting value should be avoided, particularly where children may play upon the floor. Loss of body heat by radiation to windows may be controlled by curtains. Excessive dampness combined with low temperature will increase heat loss from the body and may cause chilling, but this condition is not common in the United States.

It should be particularly emphasized that bedrooms need not always be maintained at 65° F. when unoccupied, or when occupied for sleeping.

If intermittent radiant heating is available the bathroom may also be maintained at a lower temperature. Additional local heating units, on the other hand, may be necessary in rooms occupied by persons of subnormal vitality.

Principle 2. Maintenance of a thermal environment which will permit adequate heat loss from the human body

a. *Specific Requirements*—The factors involved here are, again, air temperature, mean radiant temperature of the surrounding surfaces, relative humidity, and air movement. In cold weather, air movement and relative humidity inside the dwelling will normally be low, and the determining factor will be operative temperature, which should not exceed 75° F. within the zone of occupancy. In warm weather, humidity will decrease the limit of tolerance, and air movement will increase it. The human body is of course acclimated to higher temperatures in summer than in winter.

It is particularly important that cool moving air be made available in sleeping-rooms, since the impact of cool air is of great value in promoting healthful sleep.

b. *Methods of Attainment*—In the winter season, it should be possible to prevent overheating by proper manipulation of heat sources with a minimum use of windows. In the case of steam heated dwellings, such control is frequently difficult; both effective operation of central heating plants and a maximum of individual control of heat supply to each room are essential for satisfactory results.

In summer, air cooling and air dehumidification are valuable adjuncts to comfort, but are beyond the present economic limits of the low-rent dwelling. In the free-standing house, the installation of an exhaust fan at the top of the house to draw in cool night air through windows is also an extremely helpful, but somewhat costly procedure. In the low-rent home we must insist on through- or cross-ventilation, and it would seem not unreasonable to include in the equipment of such a home at least one electric fan

for cooling, in regions where summer heat is considerable.

Both warming in winter and cooling in summer are materially aided by suitable orientation of the dwelling as discussed in a subsequent paragraph.

Principle 3. Provision of an atmosphere of reasonable chemical purity

a. *Specific Requirements*—The important atmospheric impurities present in the home under ordinary conditions are those contributed by cooking, by various heat sources, and those derived from the human body. (Hazards from heating sources and those associated with special toxic gases will be considered in a later section.)

The odors given off from the body have been proved to exert a definitely harmful influence upon appetite and therefore upon health. With persons of reasonable cleanliness the dilution of these odors will require an air change of 10 cu. ft. per person per minute.

b. *Methods of Attainment*—Such an air change as this, with any ordinary type of construction, will be automatically attained in cold weather by normal leakage through walls and ceilings of ordinary porosity and around doors and windows, provided the cubic space per occupant is 400 cu. ft. in any occupied room, and that the normal ratio of fenestration is supplied. The necessary air change can be secured in summer by the opening of windows. Since this minimum of 400 cu. ft. is demanded by other fundamental needs to be discussed in later paragraphs, no other provision for air change need ordinarily be made in the low-rent dwelling. If the other fundamental needs could be met, and if dependable artificial ventilation were provided, a lesser air space might be permissible.

It should be noted that this standard of 400 cu. ft. applies to any occupied room. Where separate rooms are used

for living and sleeping, the total for the living portions of the dwelling must be 800 cu. ft. per person. Where the same room is used for both living and sleeping, the value should be increased to 500 cu. ft. to allow for necessary furniture.

Ceiling height may, in general, be determined by cubic space requirements and by necessary window heights.

Principle 4. Provision of adequate daylight illumination and avoidance of undue daylight glare

a. *Specific Requirements*—In order to avoid danger of eye strain and facilitate cleanliness, the minimum light value available for any occupied space relying upon natural illumination should be 6 foot candles, on a horizontal plane 30 in. above the floor.

b. *Methods of Attainment*—With unobstructed exposure to the sky, the minimum illumination defined above will be obtained in clear weather and up to a reasonable time before sunset (in the latitude of Washington, D. C.) with an area of window glass equal to 15 per cent of the floor space of a room (provided that walls and ceiling are light in color). In other latitudes the necessary window area may be greater or less. Findings of the U. S. Public Health Service on this point are being assembled by the committee.

With buildings so closely grouped as materially to obstruct sky shine, daylight illumination will be seriously hampered. This subject requires further study. At present, it seems reasonable to require at least a 45° sky angle at the lowest window sill, which implies that the width of intervening street and court space should approximate at least the height of opposite buildings. Porches should not be so placed as to obstruct the entrance of light.

All rooms, including bathrooms, should have at least one window open-

ing to the outer air. Daylight illumination should be provided for public halls and stairs, except perhaps in elevator apartments with adequate janitor service.

It is of advantage to have the tops of windows as near to the ceiling as possible, to give the greatest sky angle in all parts of the room and thus to secure the greatest lighting effectiveness. Inside walls of a good reflecting value are essential factors in obtaining the desired result. Glossy paint should be avoided on account of glare; ceilings should be matt white.

For control of glare, suitable window shades are essential; those of the Venetian blind type, although costly, are desirable, since they protect from glare while reflecting light to the inner part of the room. Windows extending below 30 in. from the floor tend to cause glare and obstruct furniture placement without materially increasing the general illumination.

It should be noted that good natural lighting is often interfered with by internal obstructions, such as draperies and furniture. It would be of advantage, where available light is near the desirable limit, so to place curtain rods that draperies may be hung adjacent to, rather than over, the windows.

Principle 5. Provision for admission of direct sunlight

a. *Specific Requirements*—No definite quantitative limits can be set; but it is clearly desirable for all dwellings, and essential for those occupied by persons who are housebound, that direct sunlight should enter at some places and hours, even in winter. Sunlight, particularly through its ultra-violet components, provides valuable physiological stimulation.

b. *Methods of Attainment* — Insolation in a given room depends on sky angle as related to that area of the sky

occupied by the sun's orbit at a given season. It will be materially influenced by orientation, by buildings or projections so located as to cut off morning and evening sun, and by the placement of windows. In the northern latitudes of the United States, a generally southerly orientation of rooms for daytime occupancy is most desirable since it gives a maximum of sunlight in winter.

Under the meteorological conditions which characterize New York City, an orientation of living-rooms 25° west of south has been found to yield a maximum of effective sunlight in winter and a minimum in summer. This relation is important in temperature control and heating economy as well as in penetration of sunlight; it should be studied for other areas.

Casement windows, because of their larger clear opening, are more desirable than double-hung windows from the standpoint of admitting the ultra-violet rays of sunlight; but they permit undue heat loss if not tightly fitted.

Principle 6. Provision of adequate artificial illumination and avoidance of glare

a. *Specific Requirements* — Artificial illumination of 6 foot candles should be generally available in all occupied rooms, with at least 10 foot candles at certain points for reading, study, or sewing. Illumination of at least 1 foot candle should be provided on stairs and in passageways to minimize danger of accidents. Glare effects should be avoided in the design and location of fixtures.

b. *Methods of Attainment* — The maintenance of the illumination specified above, and the avoidance of accident hazards due to oil lamps, can only be attained by the use of electricity. Electric lighting should be considered a minimum requirement for the healthful American home.

There should preferably be a central outlet in the ceiling of each room, with two convenience outlets in the living-room and one in each of the other rooms. In the kitchen, shadows on the sink and work table should be avoided, if necessary by installing a second fixture. In the bathroom the central fixture may be replaced by lighting adjacent to the mirror.

Sleeping-rooms should be protected from artificial external light sources such as street lights and electric signs.

Principle 7. Protection against excessive noise

a. *Specific Requirements*—Excessive noise, a factor much neglected in the United States, is of serious moment in so far as it causes nerve strain and interferes with sleep and other physiological processes. It should be possible to exclude noises from outside the dwelling unit to such a degree that within that unit the noise level shall not exceed 50 decibels; and a level as low as 30 decibels should be attainable in rooms used for study or sleeping. These standards are based on European practice and call for further examination under American conditions (including the prevalence of radios and automobiles) and under American habituations.

b. *Methods of Attainment*—The solution of this problem depends, first of all, on the control of external sources of noise, which involves the avoidance of dwelling sites with exposure to special sources of noise (factories, highways, railroads, athletic fields, and the like), and the control of motor horns and other sources of vehicular noise.

With a given environment it calls for such construction as will reduce the noise from external sources to the levels stated above.

For control of noises transmitted by air within a building, party walls

should effect a reduction of 50 decibels (approximately the result produced by an 8 inch brick wall). For control of structure-borne noises knowledge is inadequate, but the Sub-Committee on Noise of the Housing Commission of the League of Nations recommends that floors should be designed with a noise-insulating value at least 15 decibels superior to that of a bare concrete floor. (The concrete floor would probably insulate adequately against air-borne sounds.)

Further study on these points is being made by this committee.

Principle 8. Provision of adequate space for exercise and for the play of children

a. *Specific Requirements* — Opportunities for physical exercise and recreation, for both children and adults, are essential to a sense of organic well-being and the enjoyment of mental health. While these ends may be considered as primarily psychological in nature, they are attained by physiological processes and may therefore be considered under the present category. The attainment of the purposes indicated calls for adequate floor space within the dwelling and, under urban conditions, for outside space which has been defined in terms of from 3 to 5 acres of park and play spaces per 1,000 persons, in addition to more distant regional park areas. The National Park Service suggests 10 acres (including parks adjoining a city).

b. *Methods of Attainment*—For city dwellers it has been suggested that the recreation area should include a playground within such distance as to be practically accessible, and an athletic field within half a mile of each home for the use of adolescents. It is desirable that play space for young children (separated from adolescents) should be available within sight of the dwelling.

This subject of standards for recrea-

tion space is receiving further study by this committee.

It should be emphasized that provision of recreation facilities is by no means necessarily a function of housing authorities, except in large urban projects where community morale may affect the success of the project. Such facilities are logically chargeable to the community as a whole, rather than to

a specific housing project. Yet it is clearly the responsibility of the housing authorities to be certain that such facilities are, or will be, available before approving a housing scheme. In large urban developments the management may make provision for trained leaders of club and recreational activities if such service is not otherwise available.

SECTION B

FUNDAMENTAL PSYCHOLOGICAL NEEDS

Principle 9. Provision of adequate privacy for the individual

a. *Specific Requirements*—The essential concept of a home involves the possibility of that isolation from the world which every human being sometimes craves and needs. Especially in cities, the home is a needed refuge from the noise and tension of the street and marketplace. The same principle applies within the home itself. When the dwelling unit is crowded, frequent personal contacts may be the cause of nervous irritation, as detrimental to mental health as is the more obvious influence of contact infection upon physical health. "A room of one's own" is the ideal in this respect; but we can at least insist on a room shared with not more than one other person as an essential minimum. Such a room should be occupied only by persons of the same sex except for married couples and young children. The age at which separation of sexes should occur is fixed by law in England at 10 years, but some American authorities would place the figure 2 years lower. Sleeping-rooms of children above the age of 2 years, according to psychiatric opinion, should be separate from those of parents.

Furthermore, fundamental habits of decency demand that toilets, bathrooms, and bedrooms should be acces-

sible from halls or living-rooms without passing through other bedrooms or bathrooms.

Dwellings should be so spaced on their sites, and their windows so located, as to limit direct vision from one dwelling into the bedrooms of another.

b. *Methods of Attainment*—The objectives stated can be attained by various types of design, but they imply in practice at least the standards enforced under the current English legislation on overcrowding. Under this legislation, not more than 2 persons may occupy a sleeping-room. Two rooms are required for 3 persons, 3 rooms for 5 persons, 4 rooms for $7\frac{1}{2}$ persons, and so on. Bathrooms and sculleries are not counted as rooms. For the purpose of governing occupancy, infants under 1 year of age are not counted, and children between 1 year and 10 years are counted as half-persons.

It is desirable to provide sleeping space apart from the living-room, but when this cannot be done, the living-room must be provided with reasonable privacy, as outlined above.

Overcrowding cannot be prevented either by proper physical planning alone or by good planning plus care in the initial selection of tenants. It is also necessary that continuing super-

vision be exercised and that adjustments to changing family needs be made by management authorities. Limitation of boarders, control of sub-leasing, intelligent adjustment of rent schedules to family size and income, sympathetic handling of transfers or other problems due to changing family size or income are all involved in maintaining desirable conditions of privacy.

Principle 10. Provision of opportunities for normal family life

a. *Specific Requirements*—Privacy is one element in normal family life; but sociability is another, which is psychologically and socially quite as important. Opportunity for adolescent youth to meet persons of the opposite sex under wholesome conditions should be provided. To meet these needs a common living-room which can be occupied by all members of the family, plus reasonable space elsewhere for withdrawal during periods of entertainment, would seem essential. It is important for the establishment of friendships and the striking of family roots in the chosen community that continuous residence in that community should be possible through all the normal changes in family size and make-up; such continuity is intimately related to the provision of living-units adapted to families of various sizes. Furthermore, the entertainment and overnight accommodation of guests and relatives, which is as fundamental a family need in modern apartment life as in the tents of the Arabs, should be given consideration.

b. *Methods of Attainment*—A living-room providing 400 cu. ft. of space for each member of the family would seem a desirable ideal. In multiple-dwellings the needs for extra-familial social life can be met to a considerable degree by club-rooms and common rooms for a group of dwellings.

The continuance of the family in the community of its choice will be greatly fostered by the provision in every housing project of living units sufficiently varied in size to provide accommodations during the whole cycle of family development, from the phase of child rearing and gradually increasing family size, on to the period when parents whose grown children have set up their own homes will normally live by themselves. Related problems which must be solved by the planner are those of the non-typical household, such as the group of employed adults unrelated to one another and possibly desiring more than normal privacy, or the normal family plus grandparents or with an invalid member—in which cases unusual quiet or special access to the sun may be required. It is obvious that no advance provision can be made for each of these contingencies exactly as it will occur; the plea, however, can be made that the designers of housing visualize as fully as they can the varied uses of family life to which their buildings will be put, and that they provide all reasonable variety in plan arrangements. The housing needs of a population are not met by devising standard 3 and 4 and 6 room unit plans and repeating them endlessly without variation simply because they are efficient users of space and have an economical relation to plumbing stacks and stairs.

In this connection it is worthy of note that a responsible group of housing managers have recently cited as their greatest difficulty that of reconciling the living units they have to offer with the living needs of the families who apply to them for space. The conclusion seems warranted that these fundamental needs of family life have been seriously neglected in much recent American housing.

The temporary accommodation of guests and relatives is a difficult problem in the compact type of living unit

which characterizes most large-scale housing developments. In at least one recent American project it has been necessary to solve this problem by the conversion of an ordinary dwelling into semi-hotel facilities for week-end visitors and other temporary residents. It should be possible in certain large-scale housing projects to experiment with the provision of a few guest rooms serviced by the central management, and to determine in practice both the benefits and the problems attendant on providing such overflow facilities for normal family life.

Principle 11. Provision of opportunities for normal community life

a. *Specific Requirements* — In order to promote the psychological and social values which result from participation in normal community life, the home should be located in a community which contains or has easy access to the basic institutions of culture and commerce, and from which the major centers of employment can be reached without undue expense or loss of time and energy in travel.

Among the community facilities which should be made conveniently accessible to the home, the most important are: schools, churches, facilities for necessary local shopping and entertainment, libraries, and medical service. (Facilities for physical recreation have been discussed above.)

A vital community life should be fostered in housing developments by supplying, as a part of any new physical plant, the basic neighborhood facilities which are lacking, and by management policies which will encourage spontaneous community organization.

b. *Methods of Attainment* — This principle involves town and community planning and housing management as well as housing design in its narrower sense. It is, however, directly

related to the choice of sites for housing projects and the plans for their subsequent development.

The school and the workplace are vital elements in the community background of the home; they should be within reach without undue expenditure of time, energy, or money. Location of the school beyond a walking distance for the child may restrict his participation in normal and desirable extra-curricular activities. If adults are required to spend more than an hour a day in going to and from work, they may be subjected to considerable nervous and physical strain, and the time and energy available to them for recreation or participation in neighborhood activities may be materially curtailed. Suitability of location is obviously related to transportation facilities and to the family carfare budget, so that no definite standards can be set; yet the point is often of controlling importance in the selection of sites for housing development.

The provision, as an integral part of new housing developments, of community work-shops and of health centers or clinics which function under the existing local public health service appears to offer sound possibilities which have been little explored.

Although the attitudes of local governments and housing management toward the autonomous community life of housing projects should be sympathetic, great care should be taken to avoid freezing the lines of social cleavage that may so easily form around the project dwellers as a privileged group in the community. Management authorities should be alert both to encourage natural neighborhood groupings and to take advantage of normal social services existing in the area.

It should be noted that many recent housing projects not only meet the basic needs cited above but provide important opportunities for economic

coöperation and a sense of community responsibility far greater than is ordinarily attained in either urban or rural life. It seems possible that in this regard our housing program is making a substantial contribution to the most vital of all American political needs—the consciousness of and participation in the common tasks of community living.

Principle 12. Provision of facilities which make possible the performance of the tasks of the household without undue physical and mental fatigue

a. *Specific Requirements*—This principle involves avoidance both of physiological and psychological factors contributing to fatigue. The home is not merely a dwelling; for the housewife it is a work-place as well. Recent studies show that some 60 person-hours of home-making activities per week are required in the average home. The principles of sound industrial hygiene demand directness of circulation and good facilities for storage, cooking, laundering, and refuse disposal. Cleansing, which is also important in this connection, is discussed in a subsequent paragraph.

b. *Methods of Attainment*—In order to minimize fatigue from needless walking in the performance of household tasks, halls and doors should be so located that internal circulation is direct and access to outside entrances (both front and rear) convenient, especially from the kitchen. Door swings should be so arranged as to minimize interference with other doors, with furniture placement, or with circulation. Easy access to the ground is important to the housewife when she has packages to carry in, the baby to be sunned, or washing to be hung out. Walk-up apartments should therefore be limited in height to 3 stories.

So far as storage is concerned, home economics authorities emphasize the

need for a closet or wardrobe at least 22 in. deep and 3 ft. or more in width for each bedroom, cupboard space in the kitchen (protected against dust and flies), provision for storing brooms and ironing-boards, and additional general storage space for miscellaneous objects other than personal clothing and kitchen equipment. In multiple-dwellings a common storage space for baby carriages and bicycles should be provided, accessible by a ramp if not at grade.

From the standpoint of equipment, the kitchen should be provided with a suitable range. In urban areas a gas or electric range is desirable, which must meet the standards of safety discussed in a succeeding paragraph.

There should be a kitchen sink with a draining surface at the left, with the bottom of the sink set at a height of approximately 32 in., to avoid the strain involved in a low sink. Other work surfaces should not be higher than 34 in. above the floor.

Where laundering is done on the premises, a laundry tub and available drying facilities are essential. In multiple-dwellings, common laundries should be provided only if it is probable that they will be used by the prospective occupants.

The convenient disposal of garbage and refuse is important for many reasons, including maintenance of self-respect, control of flies, rats, and other vermin which may spread disease, and avoidance of fire hazards. In congested areas, a sanitary non-absorptive receptacle for garbage is an essential part of house equipment, and in multiple-dwellings special chutes discharging into incinerators have been found desirable. The best type of outside garbage receptacle is one that is set below the ground surface and protected from access of animals. A separate receptacle for ashes and rubbish should be provided where necessary, protected

against dissemination of its contents by the wind.

Principle 13. Provision of facilities for maintenance of cleanliness of the dwelling and of the person

a. *Specific Requirements*—Cleanliness of the dwelling depends in part on such construction as will facilitate cleansing; both dwelling cleanliness and personal cleanliness demand an ample supply of water (20 gallons per capita per day is a minimum for household use), with facilities for heating water. The ends in view are justified in part by the rôle of clean hands in preventing the spread of germ diseases, but on an even wider base they may be considered essential to self-respect from a psychological standpoint.

b. *Methods of Attainment*—To facilitate household cleansing, interior surfaces should be as nearly impervious, and joints between surfaces as tight, as is reasonably practical. Design should minimize dust-catching angles and pockets. Surfaces should be readily washable.

A safe water supply, adequate in quantity and under pressure, should be available within the dwelling. Where water has to be brought in by hand it will not be used in amounts necessary for cleanliness. Anything short of a pressure supply is a sub-standard compromise.

A bathtub or shower should be provided for each family where a pressure water supply is available, in addition to a wash basin.

Finally, at least a minimum supply of hot water is an essential of sanitary decency. This may be provided in the very low-cost rural home by heating water on the stove, but a hot-water heater is a basic element in really satisfactory housing.

Principle 14. Provision of possibilities for reasonable esthetic satisfaction in the home and its surroundings

a. *Specific Requirements*—It is obvious that matters of taste cannot be crystallized in quantitative terms, but it may properly be emphasized that the desire for beauty is a fundamental psychological urge whose satisfaction, in some degree at least, is essential to healthy living in the full sense of the term.

b. *Methods of Attainment*—The attainment of the ends suggested involves the application of taste and skill in community planning, in landscape design, in architecture, and in decoration, with due reference to the fact that variety is as essential as harmony in such a field. The difference in construction costs between an ugly and a beautiful building need not be appreciable, and the extra cost of brains used in planning is, in this case, relatively a very minor factor.

Principle 15. Concordance with prevailing social standards of the local community

a. *Specific Requirements*—Requirements here are obviously purely relative. It should, however, be pointed out that the sense of inferiority developed in a home notably below the standard of friends and neighbors may, and often does, produce emotional reactions, particularly in children, which are fundamentally incompatible with mental health. The public has developed a keen sensitiveness to the dangers of communicable disease, but still fails to realize the importance of emotional hazards. Under modern conditions of American living, a sense of inferiority due to living in a substandard home may often be a more serious health menace than any insanitary condition associated with housing.

b. *Methods of Attainment*—These again are relative and cannot be stated in any general terms. It is important that housing plans should take into account local social and racial stand-

ards which may profoundly modify the applications of the principle under discussion.

Social standards of a given area should be protected by proper zoning ordinances.

SECTION C

PROTECTION AGAINST CONTAGION

Principle 16. Provision of a water supply of safe sanitary quality, available to the dwelling

a. *Specific Requirements*—The water supply system should be so located, constructed, and operated that the water supply will not be a means of conveying disease; and the water should be devoid of objectionable chemical and physical characteristics. In some localities, it may be impossible to obtain water that meets all of these requirements, but in any case only a water that is safe from a public health point of view should be used. The standards established by the U. S. Public Health Service for drinking water served on inter-state trains may be used in determining the safety of the supply.

b. *Methods of Attainment*—The ideal is, of course, a communal supply whose sanitary quality is approved by health authorities. The availability of such a supply should be an important factor in selecting sites for housing projects.

Where individual supplies are the only ones obtainable, a properly protected spring or well is ordinarily the best solution of the problem. Surface supplies cannot practically be made safe for the individual household. The conditions necessary to insure a sanitary well supply are outlined in the Progress Report of the Committee on Ground Water Supplies of the Conference of State Sanitary Engineers for 1936, published as Supplement No. 124 of *Public Health Reports* (U. S. Public Health Service).

Principle 17. Protection of the water supply system against pollution within the dwelling

a. *Specific Requirements*—This principle requires construction of house plumbing in such a way that the water cannot be contaminated by cross-connections, by siphonage from bowls, tubs or toilets, or by drip into water reservoirs.

b. *Methods of Attainment*—Direct cross-connections or contamination of water reservoirs can be avoided by proper initial construction and by routine inspection of large installations by health departments to check on alterations. To avoid one common and possibly serious source of contamination—back-siphonage of polluted water into the supply—all fixture inlets which are directly connected to the supply system should be at a sufficient distance above the possible water level attained in the fixture itself to prevent contact. Numerous types of lavatories, drinking fountains, and other fixtures now in common use (and even some of those installed in recent public housing projects) violate this principle, although safe equipment is on the market. While it is unreasonable to demand remodeling of existing fixtures, this problem should receive attention in all future construction or replacement.

Principle 18. Provision of toilet facilities of such a character as to minimize the danger of transmitting disease

a. *Specific Requirements*—This principle involves, on the one hand, pre-

vention of spread of infection by flies or other insects and, on the other, reduction of the likelihood of transmitting intestinal or venereal diseases by contact.

b. *Methods of Attainment*—The ideal method of controlling access of insects to fecal discharges is the water-carriage system of sewerage, and housing projects should—so far as is possible—be located where such facilities are available. For the isolated home where water carriage is impossible, a sanitary privy so constructed as to protect fecal deposits from access of flies, and so located as not to endanger a water supply, is obviously a minimum essential. The type of privy recommended by the U. S. Public Health Service may be used where this method of disposal is unavoidable.

A separate toilet for each family would seem to be essential to insure responsibility for cleanliness as well as to promote decency.

Toilets should be located at a sufficient elevation above the sewer level to avoid back-flooding.

From the standpoint of avoiding venereal disease transmission, the toilet seat should be of an open-front type.

To avoid dangers of infection from contact with fecal matter, the walls and floor of the toilet compartment should be of material which is as nearly impervious as possible. Good lighting of the compartment is essential, since visibility is a major factor in stimulating habits of personal cleanliness. Artificial lighting alone is unsatisfactory on account of maintenance problems; a window opening to the outer air should be considered a minimum essential for all new construction. If the toilet compartment has a window opening to the outer air, no special provision for ventilation is necessary. Furthermore, many plumbing codes—based on the "sewer-gas" fetish—require quite unnecessary construction

costs (as for back-venting). The *Recommended Minimum Requirements for Plumbing* published by the National Bureau of Standards in 1931 should be used for the revision of such codes.

Principle 19. Protection against sewage contamination of the interior surfaces of the dwelling

a. *Specific Requirements*—This principle involves tightness of the house drainage system and construction of the main house drain and the external sewerage system so as to avoid back-flooding.

b. *Methods of Attainment*—Leaks of sewage on cellar floors, work surfaces, or elsewhere can be avoided by tightness of construction. To prevent the backing up of sewage into the dwelling, care should be exercised in selecting sites where adequate sewage disposal facilities are, or can be provided. Preference should be given to locations where separate systems of sanitary and storm sewers are available and to locations where ample fall can be obtained between the basement floor of the dwelling and the street sewer. Where such separate systems are in use, storm water from the roof and surface drainage should be conducted to the storm water sewer, and domestic sewage and basement drainage only allowed to enter the house sewer. Where necessary, the hazard of back-flooding the basement may be minimized by (1) installing an automatic back-water valve and a gate valve on the branch drain to which basement plumbing fixtures are connected, or (2) connecting the outlets of basement plumbing to a sump equipped with a suitable automatic pump or ejector which is arranged to discharge into the building sewer.

In the case of an isolated dwelling which is provided with an individual sewage disposal system, only domestic sewage and basement drainage should enter the system.

Principle 20. Avoidance of insanitary conditions in the vicinity of the dwelling

a. *Specific Requirements*—Where a cesspool or local sewage disposal plant is maintained, it must be so designed and operated as to avoid exposure of sewage which will permit transmission of disease by contact, by flies, or by pollution of wells; and the neighborhood must be kept free from accumulations of refuse which will afford food or harborage to flies or rats, and from standing water in which mosquitoes may breed.

b. *Methods of Attainment*—Where a cesspool or a local sewage disposal system is used, certain principles concerning the location and construction of such installations should be observed (such as location and depth of sewer; pipe sizes, materials, and jointing; and location, capacity, and covering of tanks). State health departments usually provide specifications in regard to these points. This committee is preparing suggested minimum standards for the location and design of sewage disposal systems for isolated dwellings where a settling tank and soil absorption system is used. The possibility of contaminating wells through the soil should be avoided in locating privies and sewage disposal systems. (Particularly in clay or limestone regions, available soil absorption capacity in relation to population should be considered in choosing a housing site.)

Accumulations of organic refuse which will breed flies should be avoided by provision of facilities for the removal and disposal of such refuse. Accumulations of rubbish, piles of lumber, etc., may provide harborage for rats and should not be permitted.

Stagnant water should, where possible, be removed by drainage or filling; bodies of water which cannot be removed and which are of a character to permit mosquito breeding should

be treated by appropriate anti-larval methods.

Principle 21. Exclusion of vermin which may play a part in the transmission of disease

a. *Specific Requirements*—This principle is concerned primarily with protection against mosquitoes, flies, and rats.

b. *Methods of Attainment*—Where mosquitoes and flies are present, all doors, windows, and other openings should be screened with No. 16 wire mesh. Screen doors should always open outward and should be self-closing. It is preferable to screen an entire window rather than only a part of it.

Where the rat problem is appreciable, care should be taken to close effectively all openings through foundations and floors, such as openings around pipes and cracked walls. Such openings should be closed with metal sheeting or concrete or other suitable rat-proofing material, such as asbestos board. Basement windows should be covered with strong, durable screening, such as standard 8-mesh galvanized hardware cloth. Ventilators and sewer openings should be provided with gratings. Exterior doors should be self-closing. The building foundation should be of concrete or masonry (or otherwise rendered rat-proof) and should extend (aside from frost or structural load considerations) from a point at least 2 ft. below ground to a point at least 2 ft. above ground. In case the floor is closer to the ground than 2 ft., the space in the walls between the studing should be filled with concrete, or other material indestructible by rats, up to a point 2 ft. above ground level.

Where the population to be housed is likely to be infested with vermin, provision may have to be made for fumigating clothing and furniture before occupancy is permitted.

Principle 22. Provision of facilities for keeping milk and food undecomposed

a. *Specific Requirements*—Various bacteria which cause food poisoning may propagate in foods which are not adequately cooled. Every home should have facilities for holding perishable foods at 50° F. or below.

b. *Methods of Attainment*—Either a mechanical refrigerator or a suitably constructed ice refrigerator should be considered an essential element in home equipment. Even in northern climates this will be necessary in summer. Refrigerator sizes should be adapted to family sizes; 4 cu. ft. of food storage space is ordinarily required for a family up to 5 persons.

Principle 23. Provision of sufficient space in sleeping-rooms to minimize the danger of contact infection

a. *Specific Requirements*—Experience in barracks and institutions has shown that a distance of less than 6

ft. between the centers of adjoining cots or a space of less than 50 sq. ft. per bed may lead to the spread of communicable diseases by dissemination of mouth spray from an infected occupant. The distance of 6 ft. between the centers of adjacent army cots would imply at least a 3 ft. space between the beds themselves, which is the essential point.

b. *Methods of Attainment*—To make it possible to meet the requirements above, the sleeping-room should therefore have at least 50 sq. ft. of floor space per occupant. This space is also required for placement of ordinary bedroom furniture. Assuming the customary minimum ceiling height of about 8 ft., this requirement checks with the standard of 400 cu. ft. per person suggested on other grounds.

Double-deck beds, sometimes advocated as a space saving device, are undesirable as favoring mouth spray infection.

SECTION D

PROTECTION AGAINST ACCIDENTS *

Principle 24. Erection of the dwelling with such materials and methods of construction as to minimize danger of accidents due to collapse of any part of the structure

a. *Specific Requirements*—These are being studied by the Building Code Correlating Committee of the American Standards Association, whose program includes standards for excavations and foundations, masonry work, iron and steel work, and structural loads.

b. *Methods of Attainment*—The ways in which such safety requirements can be translated into practice are

obviously too complex to be cited here.

In view of current interest in the problem, a word may be said as to the structural menace of termite infestation. In zones where such infestation is serious, special provision should be made for termite control by constructing foundations of impenetrable concrete or masonry, and by removing stumps, chips, and litter from beneath the house. Adequate ventilation should be provided for the space beneath the house; vents should be screened; the clearance between the ground and the outside of the foundation and 18 in. inside; and for the most effective protection, termite shields of copper or other durable metal should cap the

* The importance of this problem is indicated by the fact that in 1936 home accidents in the United States caused 38,500 fatalities as compared with but 37,500 motor vehicle fatalities.

foundation wall. For complete protection, these shields should be continuous and extend entirely across the foundation wall, should project 2 in. or more on either side, and should be bent down at an angle of 45°. All posts, piers, pipes, and other structural members in contact with the ground should be shielded with projecting caps or collars. Surfaces that are difficult to inspect should be given the most thorough protection.

Principle 25. Control of conditions likely to cause fires or to promote their spread

a. *Specific Requirements*—All that can be insisted on—from the standpoint of protecting the lives of occupants—is that dwellings shall be so constructed and equipped as to minimize the probability of starting fires, and that the spread of fires shall be sufficiently retarded to permit the escape of occupants. Local building codes may require that dwellings shall not collapse for a period of several hours under fire conditions so extreme as to preclude the survival of any occupant. Such requirements, which add to the cost of building, must find their justification on other grounds than those of human safety.

b. *Methods of Attainment*—Potential sources of fire within the dwelling exist in electric installations, stoves and furnaces and their smoke-pipes, and in chimneys. Prevention of electrical fires calls for such details of construction as will control danger of crosses and the avoidance of exposed wiring subject to short-circuiting through wear. These factors are adequately dealt with by the usual local electrical codes. Stoves or furnaces should be mounted clear of combustible walls and floors, and if located near woodwork, should be insulated from it by adequate air space and by mats or screens of non-combustible material. Smoke-

pipes should be securely supported, well separated from woodwork or other inflammable materials, and kept clean. Where such a pipe must pass through a combustible partition, a ventilated thimble should be used to provide an air space around the pipe. Stove-pipe openings in chimneys should be covered when not in use.

Chimneys should be so constructed and supported as to avoid danger of overheating adjacent combustible elements. Masonry chimneys should be lined with fire-clay tile, with joints staggered in relation to masonry courses. Wood beams, joists, or partition members should be placed at least 2 in. away from chimneys, with the intervening space mortar-filled or otherwise effectively insulated.

In order to prevent the spread of fire originating within the structure, safe practice demands that in multiple-dwellings (regardless of height) the following elements be of non-combustible construction: exterior walls, roofs, first-tier beams, partitions between apartments and between stair halls and apartments, and all shafts. It is hardly less desirable that all floors and floor joists also be non-combustible. Certainly all multiple-dwellings exceeding 3 stories in height should have non-combustible floors and floor joists, and all those exceeding 4 stories in height should be fire-proofed throughout. Walls and partitions may be of brick, hollow tile, reinforced concrete, or other materials which upon test show that they will resist fire or delay its spread for a sufficient time to permit the escape of occupants.

For single-family dwellings of low cost, such fire-resistive construction may not be feasible, but fire hazards should be restricted through care in the installation of stoves, chimneys, and electric wiring as described above, through fire-stopping, and through reasonable precautions in the construc-

tion and finishing of roofs and walls.

Where framing with combustible members involves hollow wall spaces, the spread of fire can be retarded by closure of these spaces with fire-stops at the floor, wall, and roof lines. Well fitted boards can serve as temporary checks, but better results will be obtained by filling the voids with non-combustible materials for a distance of 4 in. or more above the fire-stops.

Fires are commonly spread from building to building by brands or radiant heat. Most of the non-combustible types of roofing have sufficient insulating value to prevent ignition of the boards supporting them by either of these means. The protection afforded by metal roofings can be increased by placing asbestos felt between the roofing and the boards. Wood shingles should not be used on account of their poor resistance to brands; once afire, they may themselves give off flying brands and set fire to neighboring structures. Weathered wood shingles are particularly subject to ignition by brands.

Among the common exterior wall materials, the range in fire resistance begins with board finish and runs in order through phenol plywood, stucco on wood lath, stucco on metal lath, and masonry veneer over wood frame, to load-bearing masonry walls. Well maintained paint coatings will slightly increase the fire resistance of a wood surface to exterior fire sources.

It should be a routine requirement that inflammable buildings be spaced far enough apart to prevent the spread of fire by radiant heat.

Fire-fighting provisions which are usually necessary include reasonable accessibility of each dwelling to fire-fighting vehicles and an adequate water supply for fire apparatus. The provision of chemical fire-extinguishers may be justified in the halls of multiple-dwellings.

Principle 26. Provision of adequate facilities for escape in case of fire

a. *Specific Requirements*—In every living-unit, the existence of exits which will not be cut off in case of fire should be regarded as a minimum essential; and these exits should be of such a nature that they can safely be used by women and children and at night.

b. *Methods of Attainment*—Multiple-dwellings should be provided with at least two means of exit from each living-unit. For reasons of economy in construction, exception may reasonably be made in the case of multiple-dwellings of 4 stories or less which are of fire-proof construction and provided with stairways in separate fire-proof enclosures having self-closing doors at each floor; compromises may also perhaps be made in certain cases of 2 story non-fire-proof buildings.

In multiple-dwellings, the doors of public exits should open outward.

Where local ordinances require outside fire-escapes, these should be constructed in accordance with the *Building Exits Code* of the American Standards Association. It is vital that fire-escapes should terminate on solid level ground or pavement in locations from which egress is unencumbered.

It is important to note that many types of drop ladders now permitted by local codes are so heavy and difficult to manipulate (particularly when rusted or heavily painted) that only a trained athlete can be expected to use them. The danger from such devices to a woman or child on an icy night is very serious.

Principle 27. Protection against danger of electrical shocks and burns

a. *Specific Requirements*—The requirements as to structural installations (aside from fire hazards) are two: (1) Live conductors and live parts of electric equipment should not be exposed to contact. (2) Exposed metal en-

closures should be grounded so as not to become alive from failure of insulation. Portable appliances and pendent fixtures should be so placed that a person will not simultaneously come in contact with electric fixtures and with plumbing fixtures or other grounded metal.

b. *Methods of Attainment*—In bathrooms, laundries, kitchens, or other spaces where the hands are likely to become wet, electric lights should be controlled by wall switches or pull chains containing insulating links, and any lamp sockets within reach should have non-metallic shells. Convenience outlets in such spaces should be located so as to minimize the probability of touching plumbing fixtures while using electric appliances. Convenience outlets should not be located in baseboards but high enough to be out of reach of creeping infants, which placement also brings them within more convenient access for the user. Any permanently installed electric heater should have a protective grating to prevent contact.

Principle 28. Protection against gas poisonings

a. *Specific Requirements*—The chief toxic substances likely to be associated with the dwelling are carbon monoxide from imperfect combustion in cooking or heating appliances, leaking gas from fixtures, and toxic gases from certain refrigerating devices. The control of such hazards is obviously essential.

b. *Methods of Attainment*—Any gas cooking-ovens and space heaters which involve the possibility of partial combustion must be provided with an adequate flue opening to the outer air. Chimneys, furnaces, and stove-pipes should be maintained in a tight and clean condition, as should gas connections and gas heating appliances.

Where toxic gases are employed in multiple refrigerator installations, special attention should be paid to tight

and durable jointing, and a warning gas should be added to odorless toxic refrigerants (in replacing routine leakage as well as in the original installation). Rooms which contain gas cooking appliances or mechanical refrigerators should not be used for sleeping.

Precautions against carbon monoxide poisoning in a domestic garage are an obvious need, but ordinarily involve no special structural provisions.

Principle 29. Protection against falls and other mechanical injuries in the home

a. *Specific Requirements*—Hazards of this type are too diverse to be catalogued, but it is clearly essential that stairs, windows, and balconies should be so constructed as to minimize danger of falls. In view of the many serious falls which occur in the bathtub, this problem should be kept in mind in planning the bathroom. Protection should also be given against injuries on outside steps and walks.

b. *Methods of Attainment*—A stairway should not be made too steep, and a proper proportion should be maintained between the dimensions of riser and tread. Satisfactory values are 7 to 7½ in. for the riser and 10 in. for the tread. In any case, these values should meet the conditions that the sum of the tread and twice the riser equals 24 to 25 inches, and that the angle of slope is between 30° and 36°. Steps of a flight should be uniform in dimensions, as any irregularity may cause tripping.

It is essential to provide every flight of stairs with a handrail. Outdoor steps especially need rails in northern latitudes, owing to ice.

Winding stairways too narrow for foothold at the rail side must be avoided, as they particularly invite falls. If a doorway is placed at the head of a flight of stairs, which practice has merit from the standpoint of

preventing the spread of fire, there should be a landing at least 30 in. wide on the stair side of the door. If this landing is omitted, the door should have a glazed window.

Low window sills (less than 30 in. from the floor) should be avoided, especially at stairway landings. If unavoidable, low windows may be provided with one or more cross-bars to prevent children from falling out. Built-in window screens have advantages, from the casualty prevention viewpoint.

Casement windows, if designed with sufficient clearance at the hinge to permit washing from the inside, will minimize dangers in window cleaning.

There should be railings or parapets around porches, balconies, accessible roofs, etc., high enough (at least 30 in.) to prevent falling off the edge. Such falls may cause serious accidents even when the distance is not more than 2 or 3 ft.

In bathrooms, especially where built-in tubs are installed below tiled walls, built-in hand-grips should be provided, sufficiently in front of the bather's position to be within convenient reach.

In the North, sloping roofs (with a pitch of perhaps from 15° to 55°) which end over steps or walks should be equipped with snow guards to prevent masses of snow from sliding onto the head of the passerby.

Adequate lighting of exterior courts, walks, and particularly of steps, is an essential safety factor.

Principle 30. Protection of the neighborhood against the hazards of automobile traffic

a. *Specific Requirements*—Attainment of this ideal must obviously be relative, and no specific standards can be set.

b. *Methods of Attainment*—Traffic regulation is an essential element in modern community planning; and it is particularly important that traffic in the vicinity of dwellings should be so organized as to minimize danger to both motorists and pedestrians (particularly children).

Residential streets should therefore be so planned as to discourage through traffic. It is often possible to do this in new housing communities by means of dead-end streets. Blind corners should be avoided by proper study of both building placement and shrubbery.

Pedestrian routes from all residential areas should be so planned that elementary schools, local shops, playgrounds, etc., may be easily reached without crossing any major traffic way except by the use of overpasses or underpasses.

Playgrounds should be effectively screened off from automobile ways.

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

March, 1938

Number 3

MAZŮČK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

“ STRENGTH IS INCAPABLE OF EFFORT, WEALTH
USELESS AND ELOQUENCE POWERLESS
IF HEALTH BE WANTING ”

ON September 30, the English launched a six months campaign devoted largely to health education.¹ Beginning in October, several hundred meetings will take place throughout that country, occupying “some 80 health days,” including the showing of films to school children, luncheon hour talks to factory and store employees, afternoon addresses to mothers, etc. There were many distinguished speakers at the opening Conference, and the report is full of meat. The claim was made by one speaker—with a great deal of truth we believe—that the English government, the local authorities, voluntary organizations and workers, and the medical and allied professions, have for some time been building up a network of health services which is probably not equalled by any other country today.

In spite of all this the Chairman of the Council of the British Medical Association said, “The respect paid to preventive medicine in medical education today is lip service only.” There is a certain amount of learning which is necessary to pass the examinations and the charge is made that that is the chief object of the student in these courses. The Chairman also said that “neither the teachers nor the examiners had any close acquaintance with the machinery of public health service, and the senior student is not taught, as he should be, his relationship to the profession as a whole, to the public, and to the State.” Even allowing for some pessimism, we fear this is too true and that almost the same statement can be made for America. Indeed, in America we are more “practical” and even more apt to be concerned in the money making side of our profession than our confreres in England.

The statement was also made that there was never a time when young people especially were so much interested in the health matters, being keen to preserve and improve their physical health by proper clothing, exercise, etc. It was pointed out that one great drawback was that so much of the advice came from the proprietors of commercial products whose motives were not disinterested.

"The remedy is to drown the voice of selfish interest in a stream of unbiassed advice whose sources are unimpeachable."

Sir Philip Henriques laid stress on the fact that good public relations depend upon encouraging not merely the use but also the appreciation of the health services offered. For years it has been the habit of the writer to devote a lecture in a class on preventive medicine to the health services offered by the federal, state, and local governments. He has often observed that the average person does not know where to apply for information on health matters. At several universities perhaps more applications for examination of water and advice on health matters go to the agricultural department than elsewhere, probably due to the extension services which are so numerous and active, and this is true even of some universities having medical departments.

One of the speakers laid stress on the part to be played by the family doctor in the health campaign. He compared regimentation such as was carried on during the Great War with the results of individual appeal, such as can be made by the family physician. In Great Britain the feeling is strongly against regimentation and in favor of individual appeal. Lord Horder said, "To endeavour to make a nation fit by this method (individual appeal) is the last test of democracy." He stressed also that length of life was not the most desirable thing. He said what he had in mind when he spoke of fitness was "health and happiness," and that the chief object of a good administration should be to make life better and happier for the individual. "Better and happier" should be synonymous with "healthier." While in agreement with these statements, in this country certain of us have stressed the idea of efficiency, and still think that is probably the best term to cover what is meant.

In America while health education is not being neglected, special stress is at present being laid upon certain diseases, notably syphilis and pneumonia. There can be no question of the value of these campaigns, as well as others along similar lines—malaria, for example—but after all, we are somewhat inclined to favor the English plan and English ideas rather than our own, never forgetting—what we have said, many times—that in our Public Health Service, we believe that we have the largest and best trained body of sanitarians in the world. We are all, however, working toward the same end and each of us can learn from the other. Just at present we feel that the English method is more fundamental and goes to the root of things somewhat more than what we are doing in America.

REFERENCE

1. The Central Council for Health Education, Tenth Annual Conference.

SANITATION IN THE NEXT WAR

IN the present turbulent state of world affairs, war seems, unfortunately, to be more than a remote possibility. If this country should be forced into another conflict, the plans of our War Department call for the almost immediate mobilization of 300,000 citizen soldiers, and the mobilization of an army of 1,250,000 within four months.

The sudden assemblage in hastily prepared camps of such a vast army of young men who are more or less susceptible to various diseases will confront our military and civilian authorities with certain acute public health problems.

years been investigating the efficiency of various serological tests and the Laboratory Section of the American Public Health Association has been studying the problem since 1922. The U. S. Public Health Service is now also engaged in an evaluation of the serological tests for syphilis performed in this country. The Laboratory Section, at the 1937 meetings in New York City, passed a resolution sanctioning the recommendations made by Dr. Parran and his collaborators.¹ The Referee for this section on serological tests for syphilis, in her report for 1937,² suggested that further requirements in regard to personnel and additional facilities might be advantageous. The Associate Referee explained the value of the quantitative test in the evaluation of the significance of the laboratory findings.³

The means proposed for achieving higher standards of work differ chiefly in regard to the placement of responsibility. While the importance of the proper training of technicians requires no emphasis, the need of adequate supervision of the laboratory as stressed in the report of the referee is essential. For ultimate success, the director of a laboratory must have had appropriate training and experience and assure himself that members of his staff are thoroughly capable of performing the duties assigned to them. The provision of standard sera has been most helpful in the production of antitoxins; similarly, reliable sources of reagents for serodiagnostic tests should be of equal importance.

With the development of methods which permit a quantitative determination of the activity of the serum in the complement-fixation test for syphilis, it is possible to report to the physician a numerical value which is a direct index of the titer of the serum. Such data promise to be increasingly helpful, not only in diagnosis but in prognosis and as a guide for treatment.

These problems cannot be considered without attention being paid to the cost of the work. Sufficient funds should be available to provide adequate facilities, and to maintain a competent staff with sufficient personnel to permit careful work. False economy never pays; it is particularly dangerous when applied to the laboratory.

REFERENCES

1. Parran, Thomas, *et al.* Serodiagnostic Tests for Syphilis as Performed by Thirty-nine State Laboratories. A report of the committee on evaluation of serodiagnostic tests for syphilis. *J.A.M.A.*, 109:425-430, 1937.
2. Gilbert, Ruth. Serological Tests for the Diagnosis of Syphilis. Report of the Referee, Committee on Standard Methods of the Laboratory Section. *A.J.P.H.* (Supp.), Feb., 1938.
3. Mallaner, Elizabeth. Serological Tests for the Diagnosis of Syphilis. Report of the Associate Referee, Committee on Standard Methods of the Laboratory Section. *A.J.P.H.* (Supp.), Feb., 1938.

CHEMOPROPHYLLAXIS IN POLIOMYELITIS

IN 1935 workers at the National Institute of Health¹ announced that certain astringents introduced into the nostrils of monkeys tended, during a limited interval, to prevent the development of intranasally inoculated poliomyelitis.

This fact has been further elucidated at the National Institute of Health²⁻⁴ and confirmed and extended by independent workers, notably at Stanford University⁵⁻⁹ and at the Rockefeller Institute for Medical Research.^{10, 11}

This protection is believed to depend upon a local action of the chemicals upon the terminals of the olfactory nerves which apparently constitute the portal through which the virus reaches the central nervous system in intranasally inoculated monkeys.

Whether chemoprophylaxis will prove effective against naturally conveyed poliomyelitis in man can only be determined by extensive controlled field trials employing a method of application capable of completely covering the olfactory area in a high proportion of persons treated. The finding of such an effective method of application has proved difficult. The ordinary atomizer as employed in Alabama, Tennessee, and Mississippi in 1936 proved ineffective.¹² Judged by the loss in the sense of smell, the method devised at the University of Michigan was effective in completely covering the olfactory area in only about 24 per cent of persons to whom the 1 per cent zinc sulphate-1 per cent pontocaine spray was administered at Toronto during the 1937 outbreak.¹³

Failure of thorough application of chemicals to the olfactory areas, therefore, offers a possible explanation for the poor showing of the method in these field trials where the apparent reduction in poliomyelitis among the sprayed as compared to the unsprayed group was so slight as to be statistically inconclusive.

The Toronto applications were made by the method devised at the University of Michigan¹⁴ which employs a special spray tip inserted past the middle turbinates, which constitute the chief obstruction preventing ordinarily applied sprays from reaching the olfactory area. This method was advocated for use by specialists only but was found to be too time consuming to be a practicable procedure in the face of an epidemic; furthermore, its application is difficult in children too young to coöperate by holding still.

The spray is not pleasant to take and is often followed by varying degrees of local burning and headache lasting from a few minutes to several hours. Moreover, these unpleasant features which were most usually noted in adults might have been even more in evidence had the application been more uniformly thorough. Following the zinc sulphate sprays, loss of smell in varying degrees was commonly noted and, in some instances, the impairment persisted for a number of weeks. Serious permanent injurious effects were not observed, however, in any case.

Attempts to find a simpler, more satisfactory effective method of covering the olfactory areas in man are being made and it is to be hoped that they may succeed in order that chemoprophylaxis may be finally evaluated and possibly further light be thrown upon the method of natural infection for poliomyelitis in man.

REFERENCES

1. Armstrong, C., and Harrison, W. T. *Pub. Health Rep.*, 50:725-730, 1935.
2. Armstrong, C., and Harrison, W. T. *Ibid.*, 51:203-215, 1936.
3. Armstrong, C. *Pub. Health Rep.*, 51:241-243, 1936.
4. Armstrong, C., and Harrison, W. T. *Pub. Health Rep.*, 51:1105-1112, 1936.
5. Schultz, E. W., and Gebhardt, L. P. *Proc. Soc. Exper. Biol. & Med.*, 34:133-135, 1936.
6. Schultz, E. W., and Gebhardt, L. P. *Calif. & West. Med.*, 45:138-140, 1936.
7. Schultz, E. W., and Gebhardt, L. P. *Proc. Soc. Exper. Biol. & Med.*, 35:524-526, 1937.
8. Schultz, E. W., and Gebhardt, L. P. *J.A.M.A.*, 105:2182-2184, 1937.
9. Schultz, E. W., and Gebhardt, L. P. *Ibid.*, 107:2102-2104, 1937.
10. Olitsky, P. K., and Sabin, A. B. *Proc. Soc. Exper. Biol. & Med.*, 36:532-535, 1937.
11. Sabin, A. B., Olitsky, P. K., and Cox, H. R. *J. Exper. Med.*, 63:877-892, 1936.
12. Armstrong, C. *A.J.P.H.*, 27:103-111, 1937.
13. Tisdall, F. F., Brown, Alan, Defries, R. D., Ross, M. A., and Sellers, A. H. *Canad. Pub. Health J.*, 28, 523-542, 1937.
14. Peet, M. M., Echols, D. H., and Richter, H. F. *J.A.M.A.*, 105:2184-2186, 1937.

THE USE OF ANTITYPHOID VACCINE DURING EPIDEMICS

THE health authorities in England are very much disturbed over the outbreak of typhoid fever in Croydon, which is practically a suburb of London, while London itself has remained free from the disease. Hearings are being conducted and a number of lawyers representing several interests are taking part.*¹ According to the statement of the Health Officer in answer to questioning, the source of the epidemic has not yet been determined.

In the English journals much enlightening discussion is being carried on over the question of how to protect individuals who have already been exposed to infection. Is the use of antityphoid vaccine justifiable in these cases? Sir Almroth Wright laid considerable stress on the "negative phase" which followed the administration of any vaccine, holding that until the response took place and immune bodies were produced the individual had a lower resistance and was theoretically more liable to the disease than before.

In America this fear has not been allowed to have too much weight. In 1913, two outbreaks of typhoid fever occurred in Wisconsin, one in a county hospital and one in a village, in both of which antityphoid vaccine made after the method of Wright was used.¹ In both outbreaks the vaccines seemed to produce the most favorable effects. In the first there were 106 contacts vaccinated and 1 case of typhoid fever occurred after the vaccination. It was observed at the time that the case was mild and the comment was made that the vaccine seemed to exercise a favorable effect when given during the period of incubation. Certainly there was no evidence of harm being done. In the epidemic in the village, 116 contacts were vaccinated and 1 case of typhoid fever was reported among the vaccinated. In a report to the American Philosophical Society, the ground was taken that even where the vaccine failed to prevent clinical disease, it apparently had a good effect in modifying the severity of a subsequent attack. It is recognized that the cases observed were too few on which to base far-reaching conclusions, and further that there was no statistical analysis, such as that made by Ramsey.²

Perhaps the best study made on the effect of vaccine on contacts has been made in this country.² Vaccine was given to 2,402 household contacts, among whom only 9 subsequently went down with typhoid fever. Among 2,886 unvaccinated contacts, 203 had the disease. The author, Ramsey, pointed out that these figures were not comparable, but gave a correct analysis of his data as follows:

<i>Vaccination Status</i>	<i>No. of Cases</i>	
	<i>Expected</i>	<i>Observed</i>
After third dose	25.06	6
Between second and third doses	13.54	8
Between first and second doses	18.47	9

He believes that the figures from the first to second and from second to third doses of vaccine, the differences between expected and observed cases are of

* On the last day of the hearing (January 11) it was announced that the total cases numbered 290, no fresh cases having been notified for several days. The number of deaths was 38. A bulletin outside the town hall stated that 6 patients were still dangerously ill with typhoid at Mayday Hospital, and 7 others seriously ill.⁹

doubtful significance, but raises no question concerning those contacts who have received three injections, and concludes that among household contacts of primary cases which either remained at home or were hospitalized there is a reduction of 75 per cent from the expected secondary case incidence.

The discussion in the English journals is useful in bringing out a number of facts apparently not widely known, which we hope will for all time allay the fear of people over the "negative phase" as far as typhoid fever is concerned. In 1915, there were 14,836 Belgian civilians inoculated in Ypres in face of a danger very much more imminent than that in Croydon. Indeed, the Belgian Government made antityphoid vaccination compulsory with penalty of expulsion from the country. While the observations are not entirely exact, there is no known instance of increased susceptibility among the many thousands of persons vaccinated.³ Another writer challenges the opponents of vaccination of contacts to quote statistics in support of their view.

In contrast with the attitude of the *British Medical Journal*, is an editorial in the *Lancet*,⁴ which lays some emphasis on the "negative phase" following vaccination. "The transient effects of the negative phase, even if we regard them as negligible in an uninfected person, may well disturb an already changing balance between parasite and host to the disadvantage of the latter." This editorial fortunately brought out a very strong letter from Sir J. C. G. Ledingham,⁵ who says flatly that he is in complete disagreement with the ideas expressed in the editorial, and in general agreement with those of the *British Medical Journal* of the same date.

REFERENCES

1. Ravel, Mazýck P. The Control of Typhoid Fever by Vaccination. *Proceedings of the American Philosophical Society*, Vol. 52: No. 209 (Apr.), 1913.
2. *Am. J. Hyg.*, 21:677, 1935.
3. *Brit. M. J.*, Dec. 11, 1937, p. 1197.
4. *Ibid.*, Dec. 4, 1937, p. 1319.
5. *The Lancet*, Dec. 11, 1937, p. 1402.
6. *Brit. M. J.*, Jan. 15, 1938, p. 135.

PROTECTION AGAINST POISON GAS

WE have called attention to the numerous notices of antipoisonous gas activities in England, which no doubt are a constant surprise to people in this country. The letters from England to the *Journal of the American Medical Association*, for example, frequently have items of some length on the movement. Gas masks are being manufactured by the millions and being distributed to the people generally, and studies are being made over one of the most perplexing problems; namely, how to protect infants and young children. The most recent report¹ is that the British Red Cross Society has awarded nearly 33,000 certificates for first aid in chemical warfare, of which 5,734 are held by students who have successfully completed the advanced course of training. In addition to this, the society now has 1,864 fully qualified instructors available for teaching.

Just what this all means is more or less of a puzzle, but it is evident that the authorities must believe there is a real danger which needs to be provided against.

REFERENCE

1. *J. Roy. Inst. Pub. Health & Hyg.*, Nov., 1937, p. 62.

LETTER TO THE EDITOR

TO THE EDITOR

THE very remarkable address of Miss Josephine Roche on "Medical Care as a Public Health Function," delivered at the New York meeting of the Association and published in the December issue of the *Journal*, closed with the following two paragraphs:

The situation calls for leadership. No one formula or program will probably be found adequate to meet our varied needs, but a composite of many efforts and plans, some in experimental stages, some not yet under way, can and must be found. What group is better fitted to lead and carry through than the public health profession with its medical personnel and its traditions of fair dealing with the public and the medical profession alike?

A far step forward would be taken, I think, if the American Public Health Association formally recognized the problem of the present unequal distribution of medical services, and the widespread human need of today, and charged a special committee to cooperate with the U. S. Public Health Service in extending through proper methods the long accepted functions of public health work to meet modern demands and needs of our people. I hope this action may be taken.

The Scientific Session immediately by unanimous vote, requested the Governing Council to authorize the appointment of such a committee. This was done by a resolution proposed by Dr. E. S. Godfrey, Jr., State Health Commissioner of New York, which reads as follows:

RESOLVED that a special committee of this Association shall be appointed to study the public health aspects of medical care and to cooperate with the United States Public Health Service and other Federal agencies represented in the President's Interdepartmental Committee on Health and Welfare, the American Medical Association, the American Dental Association, and other appropriate bodies in extending public health work to meet modern needs,

especially those occasioned by the increasing importance of chronic diseases as causes of sickness and death. Such committee shall be appointed by the Executive Board at its next regular meeting.

At the meeting of the Executive Board, Drs. A. T. McCormack of Kentucky, J. N. Baker of Alabama, and John L. Rice of New York, were appointed a committee to invite the cooperation of the U. S. Public Health Service, the American Medical Association, and other interested agencies, in a study of the medical and public health needs of the people of the several states. The committee met with the officers and the Executive Committee of the Board of Trustees of the American Medical Association in Chicago on December 20. Dr. C. E. Waller, Assistant Surgeon General, represented the U. S. Public Health Service at the Conference. In order that the American Medical Association might realize the acute problem that had been raised by Assistant Secretary Roche's address, Dr. McCormack read it in full and he and Dr. Baker presented certain preliminary data which should be explored and expanded by all the interested agencies. On behalf of the Public Health Service, Dr. Waller stated that the Service had no concrete plan for meeting the medical care problem to submit to the Conference at that time, but pointed out the urgent need of an immediate solution of the problem. He urged that both the Board of Trustees of the American Medical Association and the American Public Health Association give the problem their most serious consideration, and recommended that a study be undertaken to determine

more accurately the nature and extent of the problem—especially the need for more adequate medical service for the groups that cannot afford to pay for such service. Dr. Waller also made it clear that the Public Health Service does not favor any plan which would call for the socialization of medicine or for the regimentation of physicians in this country, nor does it advocate any change in the method of practice of medicine which would alter the present physician-patient relationship.

After full and frank discussion, the Board of Trustees of the American Medical Association adopted the following Resolution:

WHEREAS, a varying number of people may at times be insufficiently supplied with needed medical service for the maintenance of health and the prevention of disease; and

WHEREAS, the means of supplying medical service differ in various communities; be it

RESOLVED, that the American Medical Association stimulate the state and county medical societies to assume leadership, securing coöperation of state and local health agencies, hospital authorities, the dental, nursing, and correlated professions, welfare agencies, and community chests, in determining for each county in the United States the prevailing need for medical and preventive medical service where such may be insufficient or unavailable; and that such state and county medical societies develop for each county the preferable procedure for supplying these several needs, utilizing to the fullest extent medical and health agencies now available, in accordance with the established policies of the American Medical Association. Be it further

RESOLVED, that the Board of Trustees of the American Medical Association establish a committee to coöperate with the Bureau of Medical Economics in outlining the necessary procedures for making further studies and reports of the prevailing need for medical and preventive medical services; and that the Secretary of the American Medical Association arrange to develop such activities through the secretaries of state and county medical societies in each instance, urging the formation of special committees in each county and state where committees are not available for this purpose.

The American Public Health Association feels that Assistant Secretary Roche came to it as an official representative of the people of the United States and presented a case. The Association proposes to assist the U. S. Public Health Service, the American Medical Association, and other interested agencies in making a diagnosis of public health and medical needs in the United States. It is of the utmost importance that this should be done frankly and honestly and without preconceived and empiric notions as to the remedy that will be suggested; that will be a matter for the sound judgment of the national organizations involved.

As implied in the resolutions adopted by the Board of Trustees of the American Medical Association, the organized medical profession throughout the United States will be appealed to for the purpose of giving aid along two definite and concrete lines; first, to define more clearly the problem of medical needs as they relate to the several states and sub-divisions of government within the states; and, secondly, to develop procedures looking to an amelioration of existing needs.

The Governing Council in announcing its earnest purpose to coöperate with the U. S. Public Health Service, the American Medical Association, and such other agencies as may be invited to participate, desires that each public health agency, official and voluntary, in the United States, join in an earnest endeavor to see that a careful inventory of public health and medical needs of the people is made.

ARTHUR T. McCORMACK, M.D.,
Chairman

Committee on Public Health
Aspects of Medical Care

PUBLIC HEALTH EDUCATION*

For Kansas City in October—Examples of graphic and dramatic presentation from various cities and states would be timely at the A.P.H.A. meeting in October, 1938. There should be space at Health Education and Publicity Headquarters for showing displays and for staging demonstrations, usually not possible at the Annual Meeting.

Who does an effective bulletin board display in office, lobby, or in hallway of a city hall?

How does some one *effectively* display posters or placards at a clinic? (Not the unplanned posting of heterogeneous posters in any bit of vacant wall space.)

In what schools do social science classes produce graphic presentation of health facts?

Are there manual training classes or other craft groups which might become interested in the production of illustrative devices, doing a double educational job in the school, and making available unusual material to interest parents and other adult friends?

Are there health workers skilled with tools, camera, scissors, paste pot, pencil, or other equipment, who might experiment with graphic presentation?

Suggestions on any of the above possibilities will be supplied upon request to the editor of this department of the *Journal*.

What Is Visual Education and How?—The visual phase of health

education in schools has been but lightly touched by health agencies. The possibilities for coöperation with the schools will be developed in a later issue.

But whatever we do should be based upon an understanding of visual education as it is in at least the more progressive schools and school systems. For this purpose an invaluable aid is "Audio-Visual Handbook," by Ellsworth C. Dent, who has a long experience as a teacher of teachers and a leader in visual education.

The book tells concisely about the different visual mediums, how they are used in schools, how to make them or to assemble them. There are classified reading references, lists of sources of equipment and materials.

A paragraph from the chapter on "Organizing the Audio-Visual Service" is addressed to school people, but carries a message for health workers who seek to coöperate with the schools.

It has required several years of blundering and sometimes painful experience for schools and school systems to realize that visual instruction plans, to be effective, must take into consideration the curricula of the schools concerned, the general plans of the various departments, and the specific plans and needs of individual teachers. Otherwise, as actually happens when visual aids are used haphazardly, there will be waste of time, money, and teaching effort. All three are too limited to be applied in any but the most effective manner. . . .

This little volume promises to be useful to the national or state agency which would plan materials for school use; to the local executive or staff member who wishes to approach the schools with understanding and utmost help-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Ewart G. Routzahn, 130 East 22d St., New York, N. Y.

fulness. The worker in adult education will find much that may be utilized outside the schools. And it would seem that staff training on the job, and instruction in the professional school could be more interesting and effective in the light of what this book contains.

"The Audio-Visual Handbook." Society for Visual Education, 327 S. LaSalle St., Chicago, Ill. 182 pp. Paper, \$1.25; Cloth, \$1.75.

Talk Warily and Wisely — A "Social Hygiene Day" speaker referred briefly and almost casually to a high proportion of college students as having sexual experience, with the added statement that "girls are becoming less chaste and boys more so."

The newspapers, as representing the interests of the public, promptly followed this lead, and interviews flourished, headlines blossomed.

The immediate result seemed to be that public attention was diverted from the main issues to be emphasized by "Social Hygiene Day."

At any rate we have in this incident a fresh reminder of the danger when a speaker makes casual reference to spectacular situations, or makes broad factual statements for which there is but limited statistical evidence.

One might believe that social hygiene program committees should prepare carefully worded reminders or warnings to their prospective speakers. Included might be emphasis upon the need of avoiding incidental references to spectacular situations, where time or relevancy rule out carefully detailed statements.

Along with this should go a request that generalizations without accepted proof of their accuracy should be avoided.

Listeners and readers alike may easily pick out, isolate, and accept as being of major importance an idea or

a fact a long way from the central theme of the talk or paper.

If we fail to warn our speakers we should not quarrel with newspapers or audiences which miss something we believe to be of prime importance.

Don't Waste a Newspaper Man's Time—Get acquainted with your newspaper men and women, but be discreet in breaking in upon them during busy business hours—is one message from David Resnick in "Social Work and the Press," in *Better Times*, 44 E. 23d St., New York, N. Y. Feb. 7, 1938. 35 cents.

Much of the difficulty of social agencies is caused by ignorance of news values, inability to tell a story in journalistic language, or unfamiliarity with newspaper methods. If there is any secret of success in successful publicity, it is this: search for news, write it as a news story, send it in the mail, and trust to luck.

In order to get along with reporters and editors, it is often more important to know what *not* to do than what should be done. One reason for the irritation felt by reporters and editors is the waste of their time by health and welfare executives—and the amateurs in publicity—whose very important story is just another dull item to the newspaperman, for the latter is conditioned by daily contact with the varied and exciting happenings of our complex modern world.

Another mistake is to bother working newspapermen in their offices by dropping around—especially near edition time—with a statement or picture which should have been mailed, an idea for a feature, or a vague request for "coöperation." A minor but annoying offense is to call a newspaper man needlessly on the telephone—and break in on his writing or editing a story—to discuss something which should have been sent as a memo to be read at his convenience.

The come-back from some of our readers will be that *they know* their newspaper people, and know the welcome that is extended to them as health workers. Happy indeed is the lot of those who have such informal contacts. *But be sure that you do know.*

"Topics-of-the-Month" in Indiana—Says *Journal*, Indiana State Medical Assn., Indianapolis:

In the January issue of *The Journal*, there was outlined a plan for work for the year 1938, and the plan included the idea of selecting an appropriate subject for each month, to be emphasized on the President's Page, to be discussed in *The Journal*, and to be offered as a topic for discussion at one meeting of each county medical society during the month. It is suggested that each subject be presented in such a manner as to stress its economic and public health or community aspects. The next eleven months will have the subjects as given below, and they are given in advance so that each county medical society secretary can make use of them in preparing programs, and so that each physician can have an opportunity to prepare himself to discuss the subjects: February—Syphilis . . . March—Pneumonia . . . April—Diphtheria . . . May—Maternal and Infant Mortality . . . June—Crippled Children . . . July—Highway Accidents . . . August—Occupational Diseases . . . September—Annual Physical Examination and Attention to Heart Diseases . . . October—Conservation of Eyesight . . . November—Tuberculosis . . . December—Smallpox.

"How to Win Prospects—And Influence New York's Health" is a small 4 page folder by Dale Carnegie, Chairman, Speakers' Bureau. United Hospital Campaign Committee, United Hospital Fund, New York, N. Y.

The 8 ways to help win people to your way of thinking which I outlined in my book, are the same 8 ways to help win gifts for the support of the essential health services protecting the people of New York.

Briefly repeated, these are as follows.

1. The only way to get the best of an argument is to avoid it.
2. Show respect for the other person's opinion. Never tell a man he is wrong.
3. If you are wrong, admit it quickly and emphatically.
4. Begin in a friendly way.
5. Get the other person saying "yes-yes" immediately.
6. Let the other man do a great deal of the talking.
7. Try honestly to see things from the other person's point of view.
8. Let the other man feel that the idea is his, not yours.

As far as gift solicitation goes, these 8 general methods of dealing with people may be narrowed down to 5 specific goals you will be shooting at. The goals will have to be reached one after the other, so I have attempted to list them below.

First—Know the facts. You know what the hospitals are and what they do. You know how they protect the community's health. You know the broader program of health protection which is being undertaken through integration of medical social service, convalescent care and home care with the active hospital treatment of the sick. You have made yourself familiar with this information at meetings and by reading the campaign literature. Aren't these facts, which convinced you, the same as will convince your prospect? So, Step One is: **KNOW YOUR FACTS.**

Second—Be interested in your prospect. You have studied his record to find out how much he should give. This interest in him will, in turn, help interest him in you and your appeal. Besides, it is what makes possible getting an early yardstick gift from your best prospect as a challenge to those you see later on. So, Step Two is: **STUDY YOUR PROSPECTS.**

Third—Remember the value of time. You cannot afford to take a chance on your prospect not being able to see you. So you make an appointment. Will not this make him realize the importance of your call? It will also ensure you an opportunity for personal solicitation. Let's call Step Three: **MAKE AN APPOINTMENT.**

Fourth—Know what is needed. You realize how much the hospitals dig into their own pockets for free care. You know that the 3-cents-a-day plan does not provide funds to meet these extra needs. You understand then why they need support. In the same way you can make your prospect realize why the hospitals need his gift and the gifts of the other executives of his company. Why they also need a corporate gift equal to \$4 for each of the company's employees. Step Four, then is: **GET BOTH EXECUTIVE AND CORPORATE GIFTS.**

Fifth—Have full confidence. There is no question in your mind about the need of the voluntary hospitals. Knowing their value, you have no doubt that the money will be raised.

My work in life has been to teach people the confidence they need for success. When they have that the battle is nine-tenths won.

You already have this confidence. That makes me, for one, sure of the campaign's

success. Sure that New York will have the continued protection of its voluntary hospitals. So Step Five is: LET'S START NOW, AND SEE OUR FIRST, AND BEST, PROSPECT TODAY.

Health Education in the Journal
—Health education material in *American Journal of Public Health*, Jan., 1938:

In "A State Cancer Program," by Chadwick and Lombard, on page 15, as one of 5 main features gives "Education of physicians and the laity regarding cancer." On pages 18 and 19 the present educational program in Massachusetts is considered.

In "Diabetes—An Important Public Health Problem," by Bolduan, the functions of a proposed, and now realized organization, is stated to include:

To carry on health education of the public in all matters pertaining to diabetes.

Under "Books and Reports" (pages 99–100) reviewers call attention to errors or omissions such as are so frequently mentioned under this heading. And, writers and publishers please note, such comment might easily have been avoided. These books needed more adequate editorial supervision, and more critical advance reading by outsiders before being put into final form.

In "A Selected Public Health Bibliography With Annotations," by Patterson, pages 104–105, are several references to education.

"Pneumonia Film," page 112, announces a new motion picture.

In *Hygeia* for Feb., 1938—*Hygeia* (535 N. Dearborn St., Chicago, Ill.) has bettered its cover pages by the use of photographs bleeding over one or more edges of the page.

Fourth of July accidents ("State legislatures should be informed of the facts and the most effective means of combating the menace") . . . Outwitting arthritis ("It can be done") . . . X-rays: a way to better

health through photography . . . Modern medical charlatans ("a word for the wishful") . . . Your age and your heart . . . This little pig (had trichinosis) . . . The choice of a marriage mate (10 point specification) . . . Eyes in industry (Effects of illumination) . . . Diabetes (and insulin) . . . Your skin (15 pictures) . . . Open wide! (Give the dentist a chance to serve you early) . . . "I'm not afraid of cancer!" (But, fight it!) . . . The story of human energies (The power plant illustrated) . . . First aid for fractures in skiing . . . Do you snore? (What to do about it) . . . Old dogs and new tricks (The story of Ivan Pavlov) Your health! (Health teaching helps by radio) . . . Questions and answers . . . New books on health.

In "School and Health":

Building the health curriculum in the high school . . . A dental score card for the junior high school (Malden, Mass.) . . . Body building and regulating foods . . . All in the day's work (Emotional problems met in Syracuse, N. Y.).

COMMERCIAL GADGETS

Some of us are pioneers in spirit; to experiment with the new is a delight. These adventures will test new devices, materials, processes, and, we hope, report the results in these pages.

The information offered under this heading comes from reputable sources, but usually it is all too new for the editor to give personal testimony.

Some of the commercial gadgetry will be found under "Exhibits," or other special headings.

You use pencils of 2 colors in editing copy, checking lists, correcting students' papers? Autopoint Co., 1801 Foster Ave., Chicago, Ill., now offers through local stores a "Two-color Autopoint," with selected colors indicated on the tips. Red, blue, yellow, green, purple, or black. Also hektograph leads.

The latest of numerous devices for fitting copy and type is "The Automatic Character-counting Roto-Typometer and Graphic Arts Calculator." Roto Calculating Devices Co., 354 Roger Williams

Ave., Highland Park, Ill. \$2.50. The 9 inch square device counts typewritten or printed copy by *number of characters* (not number of words which are so variable as to number of letters); gives amount of space needed in a given type face; and so on. A small 4 page folder tells how to make it work in solving copy fitting problems. The manufacturer will send "Roto-Typometer" on approval for examination and test.

Typewriting, carbon copies, drawings, etc., on any good grade of paper may be prepared easily and cheaply for blue-printing. The method may prove useful: to secure an extra copy or two of an important document for immediate use, or for preservation; as a novel form of presentation of important facts or statistics to a board or committee (budget committee of a community fund?); as a novelty invitation or announcement to a small group. The job is done by a diethyl phthalatesolox solution to the paper. For details address U. S. Industrial Alcohol Sales Co., 60 E. 42d St., New York, N. Y.

FOR EDUCATION AND REFERENCE

Modern salesmen in many lines are encouraged to carry ideas and information to pass on to their customers. Many of these salesmen are assured of a welcome because of the real help they bring along with their sales talk.

Increased interest and coöperation may be won by health salesmen who pass on selected copies of reprints, pamphlets, copies of radio talks, etc.

Under this heading may be found, from time to time, just what an alert editorial writer could use to advantage. Rotary president may welcome something else. Something may be found for the mayor, or the chamber of commerce secretary, or the woman's club program chairman. Such single items, handled by the health worker in retail fashion, may in time bring wholesale returns.

Of course much that is mentioned here will be of value only to administrator, the health educator, or some other staff specialist.

"A Baby Pays for Her Parents' Neglect" is an 8 page mimeographed booklet re-issued by the Middletown, N. Y., Health Dept. This anti-diphtheria document, written by Mildred D. Shelley, has been broadcast by Winston-Salem and Jersey City, reprinted by Rockford, and published in health periodicals in Washington, New York, and India. We are delighted to record such repeated use of good material. We hope for increased evidences of use of good copy produced in some other city or state.

"Beauty and Preventive Medicine," by C. H. Goodrich, M.D., President, Medical Society of State of New York. An argument for periodic health examinations. Reprint. Address the Society, 2 E. 102d St., New York, N. Y. *Free*.

"Child Labor Facts." The 1938 compilation. National Child Labor Committee, 419 4th Ave., New York, N. Y. *25 cents*.

"A Cold Can Rob You" is a bulletin board placard listing 10 precautions against colds. Employers Mutuals, Wausau, Wis.

Consumer Education Service, Am. Home Economics Assn., Mills Bldg., Washington, D. C. A monthly news letter. Health workers may be interested in the news from Food and Drug Administration and Federal Trade Commission, and of legislation, publications, etc., which have health angles. Hospitals and other institutions may learn about standards, grading, etc. Sample, *15 cents*.

"Methods and Equipment for Home Laundering." (*Farmers Bulletin* No. 1497.) U. S. Dept. of Agriculture, Washington, D. C. Includes section on handling infected clothes, from U. S. Public Health Service. *Free*.

"Publications" of Am. Home Economics Assn., Mills Bldg., Washington, D. C. *Free*. Classified list.

From American Social Hygiene Assn., 50 W. 50th St., New York, N. Y.:

"Facts About Syphilis." 4 pp.

"Facts About Gonorrhea." 4 pp.

"Safe Motherhood and a Healthy Child." 4 pp.

"Congenital Syphilis," by J. Marshall. 8 pp. Reprint. 5 cents.

"The Newest Generation," by W. F. Snow. 10 pp. Reprint. 10 cents.

Frequently single copies of federal government publications will be supplied free upon request direct to the government office where they originated, or to your Congressman. Early application is desirable.

For a list of state and city health councils, and minutes of the 1937 meeting of National Committee of Health Council Executives, address the secretary, Howard W. Green, Cleveland Health Council, 1900 Euclid Ave., Cleveland, Ohio.

"The Inside Story of the Depression" is an elaborate pamphlet of 32 pages, 8x10 inches, about a dozen X-ray pictures, which, with a facing page of text in the form of a case story, tells the story of health needs and medical service as they are faced by the Community Chest, Dayton, Ohio. Among the most striking of such appeals! Electrotypes, photographs, or printed pamphlet with local adaptation, may be secured through Social Service Feature Syndicate, Hotel Biltmore, Dayton, Ohio.

"Program for a General Health District and City Health District of Average Size." State Dept. of Health, Columbus, Ohio. 20 pp.

An "autographed steel engraving" of Dr. Edward L. Trudeau, about 11 by 14 inches, is offered for \$1.00 by National Tuberculosis Assn., 50 W. 50th St., New York, N. Y.

"Which One?" is a 4 page folder

on early diagnosis. "Your Child's Health" is a cyclopedic 6 page folder edited by Public Health Education Committee, Minn. State Medical Assn. Samples from Minnesota Public Health Assn., 11 W. Summit Ave., St. Paul, Minn. We are getting interested in how health agencies prepare the way for a hearing for the cyclopedic type of folder or pamphlet, or do we simply "give them out"?

American Medical Assn., 535 N. Dearborn St., Chicago, Ill., reprints from *Hygeia*:

"Bad Habits in Good Babies." 16 pp. 15 cents . . . "Marihuana." 2 pp. 5 cents . . . "The Truth About Candy." 4 pp. 5 cents . . . "What Science Knows About Cancer." 9 pp. 5½ by 8 in. 10 cents . . . "What Does Your Baby Put in His Mouth." 22 pp. 5½ by 8 in. 20 cents.

"Publications of Office of Education, 1930-1937." *Free* of Office of Education, Washington, D. C. Indicates free publications. These new titles probably *free* from the Office. Sold by Supt. of Documents, Washington, D. C.:

"Physical Education in Institutions of Higher Education." 32 pp. 10 cents . . . "Education of Negroes: A 5 Year Bibliography." 62 pp. 10 cents. Brief section on health . . . "Student Interests and Needs in Hygiene." 21 pp. 10 cents . . . "Educational Directory, 1938: Associations and Directories." 69 pp. 10 cents.

These U. S. Public Health Service publications are sold by Supt. of Documents, Washington, D. C.:

"The Bed Bug." 7 pp. 5 cents . . . "Public Health Nursing." 14 pp. 5 cents . . . "The Rat and Ratproof Construction of Buildings." 68 pp. 15 cents . . . "Some Public Health Service Publications Suitable for General Distribution." 21 pp. 5 cents.

National Organization for Public Health Nursing, 50 W. 50th St., New York, N. Y., reprints at 10 cents each:

"The Nurse Stimulates Employee Interest in Safety" . . . "A Study of Volunteer Services" . . . "Student Affiliation With a Public Health Nursing Agency."

For these reprints from "Hospital Survey of New York" address the author, Dr. E. H. L. Corwin, N. Y. Academy of Medicine, 2 E. 103d St., New York, N. Y.:

"Ambulance Service" . . . "Institutions for Convalescent Care" . . . "Control and Coördination Concerned with Organized Care of the Sick."

SAFETY

Accident Prevention Conference of Dept. of Commerce, Washington, D. C., has issued two well done booklets:

"How to Stop Farm Accidents." 22 pp. Free.

"How to Stop Home Accidents." 14 pp. Free.

In Nov., 1937, school children of New Milford, N. J., riding bicycles to school were required to have license plates on their machines, and to carry riders' licenses. B. F. Gibbs, supervising high school principal, engineered the plan as a safety measure. The license cards bear on the back a 14 point bicycle code.

A book bargain is offered by National Society for Prevention of Blindness, 50 W. 50th St., New York, N. Y. "Eye Hazards," by Resnick and Carris, is a \$1.50 book of 247 pages, except that some of the safety devices in the pictures are outmoded. The present bargain price is 50 cents.

A bulletin board poster attempts to make graphic the baffling characteristics of carbon monoxide gas. At one side of the poster are 4 blank white panels captioned: "What it looks like!" "What it tastes like!" "What it smells like!" and "What it feels like!" Employers Mutuals, Wausau, Wis.

An "Education in Accident Prevention" issue of *Journal of Educational Sociology*, 32 Washington Place, New York, N. Y., is dated Sept., 1937. 35 cents. Includes

Application of psychological methods to

safety education . . . The nonreduction of accidents . . . Mental hygienist looks at safety education . . . Education programs in Cleveland and Baltimore schools. The editorial urges the failure of "spread or transfer," and the resultant need of direct education. Says the editor:

The purpose of this agitational article, therefore, is to urge those interested in education in accident prevention to take the strict Thorndike point of view as a fundamental of psychology; to work from the Thorndike point of view and insist upon specific instruction to meet each specific accident situation of any importance.

The following subjects will be featured in the 1937-1938 issues of *Safety Education*, the magazine for home and school, 1 Park Ave., New York, N. Y. (sample upon request):

Oct., Fire prevention . . . Nov., Safety in the school shop . . . Dec., Holiday safety . . . Jan., Safety lessons from nature . . . Feb., Accident reports and their use . . . March, Bicycle riding . . . April, Spring games . . . May, Vacation safety.

A group of accident and safety articles in *Red Cross Courier*, Washington, D. C. Dec., 1937. Includes review of recent progress in rural extension of first aid.

In the 21st volume is *California Safety News*, the little quarterly issued by Industrial Accident Commission, State Bldg., San Francisco, Calif. A feature of the Dec., 1937, issue is a group of case stories: "Another Scaffold Accident" . . . "Broken Grindstone" . . . "Did He Think?" . . . "Who Was Responsible?" These and other stories appear under the general heading across two pages: "These Accidents Were Caused, They Did Not Merely Happen."

"Quick! Henrietta, the Iodine!" is the title of an article on accident emergencies in the home. *Health*, 105 Bond St., Toronto, Ont. Dec., 1937. 15 cents.

The National Safety Council reports 106,000 fatal accidents in 1937, with 15 per cent decrease for the year in

the home, 5 per cent decrease in public (non-traffic), 6 per cent increase in occupational, and 4 per cent increase in traffic deaths.

Aetna Affiliated offers "How Good a Driver Are You?" "Check Yourself by taking this safe driving examination." One of the popular self-scoring devices which the alert safety worker can get into use in groups as well as by individuals.

The Committee on Accident Prevention, Canadian Public Health Assn., recommends that—

Nonofficial local agencies engaged in the education of the public in connection with traffic safety should be encouraged to make use of the services of municipal health departments when planning safety campaigns.

"Guides to Traffic Safety," prepared by Executive Committee of National Conference on Street and Highway Safety, is published by Bureau of Public Roads, U. S. Dept. of Agriculture. Seems particularly helpful to health workers as a general review of the field. There are sections on education, school, and general public. Supt. of Documents, Washington, D. C. 10 cents.

Home accidents, safe driving, home and community fire hazards are treated in educational material from Aetna Affiliated Companies, Hartford, Conn. Especially interesting is "Let's Be Skillful" with 10 good sized page diagrams of street hazards. (Not quite so clear as they could have been if appearance had been neglected slightly for effect.) These pages suggest their reproduction on bulletin boards, or for school use. In home or school similar problems might be worked out with cut-out pictures of automobiles.

National Fire Protection Assn., 60 Batterymarch St., Boston, Mass., is a source for educational plans and materials for use in schools or elsewhere. "Fire Prevention I.Q." is a 4 page folder; 25 questions, each with 4 or 5 possible answers, the correct answers

on the 4th page. Rotary and other luncheon clubs would be interested in getting copies (100 for 50 cents) to test their members at the weekly meeting. Samples free.

"A Pictorial Story of the American Highway" includes a group of scenes to illustrate the statement of the National Safety Council that in many instances the billboard "seriously distracts the attention at such critical locations as underpasses, grade crossings, and abrupt hill crests." In *Roadside Bulletin*, National Roadside Council, 119 E. 19th St., New York, N. Y.

"The Psychology of Accident Causation and Prevention," by H. M. Vernon, M.D. *Trained Nurse and Hospital Review*, 468 4th Ave., New York, N. Y. Oct., 1937. 20 cents. Accident-proneness and treatment, child suggestion susceptibility in accident prevention.

A surprisingly simple idea for safety education in a small shop is described under "A New Idea In Safety Programs" in *The Foreman*, Employers Mutuals, Wausau, Wis. Nov.-Dec., 1937. In brief, every employee in turn is Safety Marshal for a day. His first duty is to write a 10 to 20 word safety message (warning, reminder, or factual statement) which is posted in a frame where all workers may see it. His second duty is to appoint the Safety Marshal for the next day. The reproduction of one of the messages in its display holder emphasizes the hopefulness of the idea. It might be tried in offices, schools, etc.

A 2 page bulletin on "Special Winter Hazards," Employers Mutuals, Wausau, Wis., mentions slippery walks . . . falling on icy ground (how to fall without injury) . . . frostbite . . . snow on roofs . . . icicles . . . cranking . . . carbon monoxide poisoning . . . and gives bad weather driving hints and how to thaw frozen pipes.

What about safety? This question is raised as the conclusion of "Auto-

mobiles of 1938," by D. H. Palmer, *New Republic*, 40 E. 49th St., New York, N. Y. Jan. 5, 1938. 15 cents. The article reviews the varied improvements and so-called improvements. Almost anything man may think of is there—except durability, economy, and safety.

STAFF TRAINING

"Community Health Education" is one course announced for the 1938 summer session for public health nurses, University of Kentucky, Lexington, Ky. First term, June 13 to July 16.

"School of Hygiene and Physical Education." Reprint from annual report of the President. Stanford University, Calif. Free. About Division of Informational Hygiene, Division of Physical Education Activities, Men Students' Health Service, University Health Service, etc.

"Selection and Training of Nurses by a State Health Department," by L. M. Blaisdel. New York State Dept. of Health, Albany, N. Y. Reprint. Free.

"Tuberculosis: A list of free and inexpensive materials." *American Journal of Nursing*, 50 W. 50th St., New York, N. Y. Dec., 1937. 35 cents.

"What Does the Student of Institutions for the Education of Teachers Know about Eye Health?" by A. M. Phelan. *Sight Saving Review*, 50 W. 50th St., New York, N. Y. June, 1937. 50 cents. Reprint for 10 cents.

Up in Buffalo it was that 70 or more public health nurses attended the first Institute on Health Education and Interpretation of Public Health Nursing Services conducted by the New York State Dept. of Health. The meeting was planned by Florence Manley, R.N., District Supervising Nurse, and Ethel Hendriksen, Field Agent of the Division of Public Health Education.

The primary purpose of the Institute was to bring about better understanding of the health objectives of lay organizations, such as home bureaus and 4-H clubs, and to demonstrate how guidance by the health officer and the public health nurse is welcomed by these agencies. By careful study of health education methods it is hoped that nurses may make their services in this field more effective.

The discussion centered about the public health nurse and her part in health education, and the community and its resources for health education.

Commonly used technics were presented: radio, newspaper releases, public addresses, reports, and community organization.

MAGAZINE ARTICLES

Articles to read, to quote, to mention in bulletins, to write letters about.

In one year *Look* has reached 2 million circulation and *Life* in 14 months has reached 2 million a week. Possibly we should study both *Life* and *Look* to seek some understanding of the different audiences.

Here is another: *Picture*, 350 E. 22d St., Chicago, Ill. Monthly. 10 cents. One of the better grade of picture magazines; goes for the "picture essay" form, as it is known to *Life*. In March, 1938, are 4 pages on "How Should You Tell Your Child about Sex?" prepared with cooperation of American Social Hygiene Assn. The opening is a page picture thus captioned:

"Why Is Bobby Different?" Brothers and sisters enjoy an immense advantage over the "only child." When Betty and Bobby swim together they notice the differences in their bodies in the same way that they observe anything that seems unusual to them . . . And they will want to know "Why?" Wise parents explain that boys and girls are formed differently so that they may later become fathers and mothers.

In the same issue of *Picture*: "Diagnosis While You Wait." 4 pages emphasizing, not horribly, that

"This marvelous 'frozen section' method saves lives every day. Suspected cancer

tissue is diagnosed during operations. The surgeon has his answer in 5 minutes."

"And Now, a Co-op Hospital," by A. D. Carlson. (Elk City, Okla.). *Survey Graphic*, 112 E. 19th St., New York, N. Y. Sept., 1937. 30 cents.

"Crippled in the Tongue," by A. D. Carlson. *Harpers*, 49 E. 33d St., New York, N. Y. Oct., 1937. 40 cents. Speech defectives.

"Home, Lethal Home," by R. E. Vernor. *Rotarian*, 35 E. Wacker Drive, Chicago, Ill. Jan., 1938. 25 cents.

"It's startling but true! You're safer"—statistically speaking—dodging highway traffic than in the bosom of your own household.

"How Fast Can You Stop Your Car to Avoid Hitting a Child?" Two pages of pictures showing how "Jerry," a wooden dummy of a boy on roller skates, and an "electric eye" check a driver's reaction in the face of actual accident causes. *Look*, Des Moines, Ia. Feb. 15, 1938. 10 cents.

The *Ladies Home Journal* has joined the tabulators of "public opinion." The Feb., 1938, issue reports that the women of America believe:

"That young people should be taught more about sex before they get married."

"That sex instruction should be given by their parents."

"Minds That Come Back," by J. D. Ratcliff. *Collier's*. Feb. 12, 1938.

"Insulin shock, the new, violent method of dealing with certain forms of insanity, is as dramatic as medieval magic. And it really works. Dr. Manfred Sakel, its inventor, has brought hope to hundreds of thousands of persons otherwise condemned to a life of constant nightmare."

"Night Call," by W. Martin. *Collier's*. Dec. 25, 1937. "Story of a young doctor whose heart and courage were greater than he knew."

"Now They Are Ahead of the Public," by Douglass W. Orr, M.D. and Jean W. Orr. *Survey Graphic*, New

York, N. Y. Feb., 1938. 30 cents. "The changed front of the British medical profession toward health insurance." What the medical secretary of the British Medical Assn. says.

"Pneumonia Mortality May Be Cut in Half by Use of New Serums." 5 pages of pictures with text. Includes portraits of Dr. Parran and Dr. Rice. *Life*, 330 E. 22d St., Chicago, Ill. Dec. 20, 1937.

"Preying Guests," by Dr. V. G. Heiser. *Collier's*. Jan. 15, 1938.

"The way parasites behave is an open scandal, but nobody can call them dumb. . . . Dr. Heiser describes their adventurous careers and the means at our disposal for stopping them."

"The Student Nurse Prepares for an Arduous But Noble Profession" at Roosevelt Hospital School of Nursing she studies, has fun, cares for the sick. Eight pages of pictures, and cover picture. Practically none of those in the pictures are looking at the camera, and the reader. Text emphasizes the professional training, and the desirable personal characteristics. *Life*, Chicago, Ill. Jan. 31, 1938.

"Traveler's Aid," by Dr. V. G. Heiser. *Collier's*. Jan. 1, 1938.

"If you are going to get any good out of your trip you have to stay well . . . Dr. Heiser, who has spent his life traveling, tells you what to look out for."

"The Unhappy Drinker," by F. T. Chambers, Jr. *Saturday Evening Post*. Jan. 15, 1938. Tells of "the key to the behavior of the unhappy drinker," and explains that

Neither the novice nor the seasoned alcoholic can be helped by emotional appeals or by threats of punishment—as families of drunkards would do well to learn. The problem must be faced in a scientific, matter-of-fact manner, with no more moral judgment brought into play than if the patient were suffering from typhoid fever or a broken leg. The alcoholic is already emotionally unbalanced, and appeals to his better nature

are as useless as appeals to the logic of a man who is insane.

If the abnormal drinker is treated as a medical case, suffering from a common form of mental illness, little damage is wrought his self-respect, and results are more rapidly obtained. . . .

"What 19,000 Doctors Could Tell Us," by Douglass W. Orr, M.D. and Jean W. Orr. *Survey Graphic*, New York, N. Y. Dec., 1937. 50 cents.

"Dr. and Mrs. Orr have made the first intimate study ever attempted of how wage earning families no less than panel doctors feel about the health insurance system that Britain inaugurated 25 years ago."

"The Workers Say, 'Yes—and More,'" by Dr. D. W. Orr, and Jean W. Orr. *Survey Graphic*, New York, N. Y. Jan., 1938. 30 cents. British wage earners want more of sickness insurance.

MOTION PICTURES

A 1937 revision of "Medical and Dental Films" is available through Bell and Howell Co., 1801 Larchmont Ave., Chicago, Ill. 73 mimeographed pages. 50 cents. List of available professional and popular 16mm. films on medical, surgical, health hygiene, and dental subjects. Includes psychology, biology and allied subjects of professional interest. The strictly health pictures are limited in number. A chapter on "Making Medical Movies."

Aetna Life Affiliated Companies, Hartford, Conn., offer films and slides on safety topics for free use.

Highway safety: "Saving Seconds" . . . "The Truck and the Driver" . . . "Let's Be Skillful" ("There's no fun being a dub!") . . . "How to Park Your Car."

Fire prevention: "The Bad Master" . . . "Sounding the Alarm."

Home accidents: "Sentinels of Safety."

If you wish to check the use of motion pictures in exposition or fair exhibits see "Behind the Screens at the Century of Progress." Reports on the practice of exhibitors as to silent

and talking pictures, amateur and professional, space required, how projector was placed, when chairs are needed, about continuous operation, size of screen, etc., together with a machine manufacturer's arguments for the use of pictures. Bell and Howell Co., 1801 Larchmont Ave., Chicago, Ill. Free.

"Social Service and the Films," by Dee Lowrance. *Better Times*, 44 E. 23d St., New York, N. Y. Feb. 7, 1938. 35 cents. A review of the commercial production of social films, the attitudes of producers, the *March of Time's* presentation of health and other social themes, the documentary films being made in England and the situation in this country. Of interest to health workers as background on health movie production.

"The Why and How of Titles," by J. W. Moore. *Movie Makers*, 420 Lexington Ave., New York, N. Y. Feb., 1938. 25 cents. Crowded with ideas on when, what, and how. (Other usable material, of course, in the same issue.)

"Without doubt," says Michigan Tuberculosis Assn.:

"... talking pictures have been the means of interesting many people in tuberculosis. Clearly explaining the importance of the tuberculin test and diagnostic chest X-ray in discovering tuberculosis early, the motion picture program is an invaluable phase of the Association's constant health education campaign. To build up a far-reaching movie program is the aim of the association. During the coming school months, showings will be concentrated in lower Michigan. "Contacts" and "Behind the Shadows" will be presented before as many schools as possible."

"Behind the Shadows" is the first sound movie produced by the National Tuberculosis Association. The same picture has been made with titles for use without sound. Both versions are available in 35mm. and 16mm., both on safety film. One reel.

"The photography is of the best; it was done in an eastern studio under the direction

of Hollywood-trained experts. Hospital and medical scenes were checked for authenticity by two physicians while the photography was in process. The animated diagrams were executed by the staff illustrator of the Presbyterian Hospital in New York, who is master of animated diagram technic. The sound effects are perfect—good diction, clear enunciation."

NEW

Here's Health is a mimeographed news sheet to supplement *Delaware Health News*, the printed bulletin. State Board of Health, Dover, Del. Part of a news release announcing the first issue follows.

Under the title "Here's Health" the State Board of Health has commenced the publication of a mimeographed house organ, to be sent to board members, staff and interested associates, with the announced purpose of more firmly welding together the workers through keeping each informed of the programs, activities, and problems of the others.

An outline drawing of the State of Delaware and its counties, with small circles indicating the principal communities, acts as a background for the text of the first page, while the title, "Here's Health!" in half-inch letters, occupies the upper right corner. In ordinary publications this outline map will serve to set off the text, but it will be possible to use it for purposes of statistical indication, by typing-in the names of towns or counties, or by indicating them with different markings.

DATES AHEAD

Health agencies generally may make some use of special days, even outside of their own special fields. To remember a special day on the office bulletin board, in a staff meeting, or in the staff house organ will be at least a minor contribution to broader staff interests. Worth while, is it not?

It was in March, 1877, that the first visiting nurse started her rounds.

St. Patrick's Day, March 17, may well be made a peg upon which to hang a health editorial—if suggested to a sympathetic editorial writer.

The first day of spring. March 21,

should tempt some special news releases. How about the "sulphur and molasses" of by-gone days?

And April 1 is the day for remembering the greatest of them all, the health fool!

National Negro Health Week, April 3-10, 1938. Plans are outlined in *National Negro Health News*, U. S. Public Health Service, Washington, D. C. Send early request for samples of bulletin, poster, and school leaflet.

Daylight Saving, in many communities, starts the morning of April 24.

National Garden Week, National Boys' and Girls' Week, and National Better Homes Week usually come in April, but no 1938 announcements have been noted.

May Day is not far off. We have heard of no national planning, but doubtless some states and many cities will initiate plans for a Health Day.

"National Hospital Day," May 12, is also "Florence Nightingale Day." What several cities did a year ago is reported in *Hospitals*, 18 E. Division St., Chicago, Ill. Feb., 1938.

A "Drive Safely" poster contest closes April 29, 1938. Prizes of \$10 up to \$1,000, are offered by Devoe and Raynolds Co., 1 W. 47th St., New York, N. Y., who will send the simple instructions. The "problem" as stated:

To create a poster so dramatic and compelling that it will induce motorists to drive safely—thus reducing the annual toll of accidents in this country which bring sudden deaths to thousands of persons and cause many more thousands each year to live on in the nightmare of mangled flesh and bones.

Money and fame await the artist who can most successfully create such a poster. And to that artist, thousands of persons including, perhaps, members of his own family, will owe their lives!

Early Diagnosis Campaign for 1938 will soon be on. "Uncover Tuberculosis by Modern Methods: 30 Years of Health Education." An 8 large page

pamphlet; tells "Why," "When," "Where," to campaign, "Who" to reach, and "How" to go about it. A striking pyramid emphasizes the audiences and the job to be done. The materials described include pamphlets, posters, talks, newspaper copy, a new movie, exhibits, and several forms of direct national aid. Get copy from some tuberculosis association.

REPORTING

A diagram of activities is included in the annual report of Massachusetts Society for Mental Hygiene, 3 Joy St., Boston, Mass. Simply made, it gives a quick review of what the Society was doing last year.

"Guarding the Health of Kern County" appears in the center of the cover-page and the title-page of the annual report of Kern County Dept. of Public Health, Bakersfield, Calif. *There is a detailed table of contents. There is a page on "Activities in Public Health Education."* There are 3 pages reporting on the coöperating agencies, public and private. There are nearly 2 pages of comment by Health Officer Smith, partly buried as "Conclusions" at the end of the report. This material was worth moving to the front part of the book, and then setting it in larger and more readable type.

Again "Guarding the Health of Baltimore" appears on the blue bound pamphlet which contains "A reprint from the annual report of the City Health Department." Two pages tell about health education. Back of the title page appears this quotation from Governor William Bradford's History of Plimmoth Plantation:

"Out of small beginnings greater things have been produced by his hand that made all things of nothing, and gives being to all things that are."

New Haven's Dept. of Health annual report *has a table of contents.* The title page carries an upright bar

diagram of New Haven's health dollar. We will tell more about the page and a half on public health instruction next month.

On the cover a lighted candle, and these words: "How far that little candle throws its beams! So Shines a Good Deed. . . ." On the title page: "A Decade of Sight Saving: 1927-1937. The Illinois Society for the Prevention of Blindness" (203 N. Wabash Ave., Chicago, Ill.) Inside is a narrative account of the 10 years, with open readable pages, which will not be read through quite as generally, or be remembered as fully, as would have followed the addition of sub-headings.

Here is a new proposition as to publication of reports: All concerned with rehabilitation of the tuberculous know about the Altro Work Shop, which is a major undertaking of Committee for Care of Jewish Tuberculous, 71 W. 47th St., New York, N. Y. Executive Edward Hochhauser announces a comprehensive report of the committee and the 22 years of the Shop; about 80 pages, including contributions by Dr. Kendall Emerson and Louis I. Dublin, photographs and charts. Copies available if ordered in advance. *35 cents, paper; 55 cents, in cloth.*

IN BULLETINS AND JOURNALS

The most unusual health journal of the month was the Dec., 1937, issue of *Journal of Social Hygiene*, 50 W. 50th St., New York, N. Y. This issue was devoted solely to the 25th anniversary dinner of the American Social Hygiene Association, an event in honor of Dr. William Freeman Snow. There are many pages of addresses, and of messages from those who could not be present.

"Public Health and Social Work" is a new heading under "Books and Periodicals" in the monthly issues of *Journal of Home Economics*, Mills Bldg., Washington, D. C.

Understanding the Child, National Committee for Mental Hygiene, 50 W. 50th St., New York, N. Y., seeks to give atmosphere and information introductory to each of its articles. Usually there is a one column cut of the author. Across the 2 column page is a paragraph about the author and the article. Under "With Our Contributors" are grouped personal notes about some of the authors.

"A Year of Best Records . . . 1937 a Star Health Year" according to *Statistical Bulletin*, Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y. Jan., 1938. *Free*.

Too many capital letters make needlessly difficult the reading of *National Negro Health News*. This difficulty carries over even to the display pages where every word starts with a capital. With capital for first word of a line the whole would look better and read better.

"Book and Pamphlet Notices" is a useful section of *Ohio Public Health*, Ohio Public Health Assn., 1575 Neil Ave., Columbus, Ohio.

"The Doctor's Reply." *Weekly Bulletin*, Municipal Dept. of Health, Albany, N. Y. Dec. 30, 1937. "Doctor, can you cure me?" as answered by Drs. Charlatan, Cocksure, Play-for-time, Pseudo-Honest, Foolishly Honest, Cruelly Honest, and Sensibly Honest.

Health Habits, Iowa Tuberculosis Assn., Flynn Bldg., Des Moines, issued for teachers, is pleasing to the eye because of the substantial light green paper.

Memphis Health Bulletin, Memphis, Dept. of Health, carries a table of contents on the inside cover page.

N. J. T. L. News, weekly mimeographed bulletin of the New Jersey Tuberculosis League, 15 E. Kinney St., Newark) impresses one with the weekly

record of extensive and varied health activity in a populous state. The persistent way of the League in supplying, week by week, ready made copy for local use ought to bring educational material into many periodicals throughout the state. Almost all of this material is submitted with suggestions for local adaptation. We hope to receive a report on the extent of actual local use.

This Job of Ours, bearing signature of Health Commissioner John L. Rice, is a weekly, one page sheet, going to the 2,500 employees of the New York City Dept. of Health.

The Nov. 22, 1937, issue began with this paragraph:

A SILVER LOVING CUP was awarded to the Department last month. It was presented by Namm's Department Store for a window display prepared by the Bureau of Health Education with the assistance of the Chemical Laboratory. As part of the celebration of Brooklyn Day, Namm's gave window space for exhibits explaining the work of the various city departments. The Health Department's exhibit which dealt with the protection of food was seen by thousands. The preparation of exhibits is but one part of the work of the Bureau of Health Education.

Then followed 4 paragraphs telling more about the educational contact of the department with the public, and with professional groups.

"Why Children Die?" in *Birmingham's Health*, Birmingham, Ala., Sept., 1937) is followed by two pages on "The Leading Causes of Death in the Younger Age Groups in Jefferson County." "Under one year," and 7 other periods are given, and for each are the percentages of total deaths for the 4 chief causes of death in the period; at the left a cut of four horsemen of death, at the right a silhouette of a child of the respective age period.

BOOKS AND REPORTS

Annual Report of the Surgeon General, Public Health Service of the United States—*Fiscal Year Ended June 30, 1937*. Washington: United States Government Printing Office, 1937. 164 pp. Price, \$.60.

This *Report* is so succinct that a review is somewhat difficult. Only a few of the high points can be mentioned.

Some changes have taken place in the administration. During the year, five offices: Child Hygiene, Milk Investigations, Stream Pollution, Public Health Methods, and Statistical Investigations, which have heretofore operated as separate units in the Division of Scientific Research were merged to form the Division of Public Health Methods in the National Institute of Health.

The Division of Mental Hygiene has completed its 7th full year. Its chief work has been the study of the nature and treatment of drug addiction, carried out largely at the Narcotic Farm, Lexington, Ky.

During the year a plan of "Radio Pratique" was evolved by means of which ships have been able to proceed to dock without stopping at quarantine anchorage and without being subjected to quarantine inspection prior to entering a United States port.

Cholera remains limited to southern Asia and adjacent islands with a high incidence in India, French India, French Indochina, and Siam. Plague was of widespread distribution and attained high incidence in the Far East, in Ceylon, India, and Dutch East Indies; in Africa, as evidenced by reports from Kenya, Uganda, Union of South Africa, and Mada-

gascar; in South America, as reported in Brazil, Peru, Ecuador, and Argentina. Yellow fever appeared to be limited mainly to Africa and South America.

In the scientific work one of the most interesting things has been the continued study of hemolytic streptococcus diseases. A method of purifying and precipitating the erythrogenic toxin of the scarlet fever streptococcus has been developed. The use of such material for active immunization against scarlet fever greatly reduces the objectionable reactions and at the same time increases its immunizing properties. The practicability of the method has been tested in a group involving over 10,000 persons, 85 per cent of whom were susceptible grammar school children and were protected.

The publications of the department have been continued, but it has been found necessary on account of finances to cut the number of pages from an average of 3,000 to 1,700. Many reprints and supplements have, however, been issued, and during the year a new publication called "The Health Officer" has been put out as an experiment in public health education. In spite of the fact that no effort has been made to increase the circulation it has practically doubled.

The Division of Venereal Diseases has been, as might be expected under Surgeon General Parran, active. The American Society of Clinical Pathologists with the Service, has sponsored a project for determining the reliability of serodiagnostic tests for syphilis originated by American serologists, and also the efficiency of state and local laboratories in performing such tests.

In general it was found that the tests are reliable and in most state laboratories the performance of the tests is entirely satisfactory.

Altogether, this report is exceedingly interesting and valuable. It is the story of the work being carried on by what we have often said is the largest and best trained body of public health workers in the world.

MAZŸCK P. RAVENEL

Esperimenti Di Vaccinazione Antituberculare—*Carried out under the Control of the Committee Technical-Scientific, of the Institute for Anti-tuberculous Vaccination. From the Laboratory of Comparative Pathology of the Royal University and Institute for Anti-tuberculous Vaccination of Milan. Director: Prof. A. Ascoli.*

In the English summary of this Report are given the results of the experiments in the use of immunizing products against tuberculosis in calves.

The experiments were carried out on 94 calves, and two tests for immunity were employed: (1) by injection of virulent bovine bacilli, (2) by exposing the treated calves to animals suffering from open pulmonary tuberculosis, thus establishing a sure source of natural infection.

It appears that the use of live bacilli gave excellent results in immunizing calves against both fatal doses of virulent tuberculous infection and natural exposure to the disease, and that no other form of vaccination, such as the dead heated cultures, is of value in immunization. When large amounts of dead heated cultures were injected in an effort to immunize calves, they not only were not protected but were much more susceptible to subsequent exposure to tuberculosis.

When using living bacilli for immunization unless calves were revaccinated and kept for a certain time

after away from natural contagion the protection was not as marked. Unless precautionary measures are carefully observed, even the use of live bacilli for immunization will fail. In other words the precautionary measures are essential to success in immunization of cattle against tuberculosis.

This research represents painstaking investigation which deserves commendation, but the results are a little difficult to interpret because of the way they are expressed in the translation into English.

The situation in which these researches were carried out is perhaps quite different from those existing in the United States but we believe that in general the effort devoted to tuberculosis could much better be given to eradication such as has been carried out in the United States. With the exception of two states, the entire United States at present has been declared a modified accredited area for bovine tuberculosis, which means that in such areas there exists less than one-half of 1 per cent of the disease in cattle.

A. J. DURANT

The Cost of Adequate Medical Care—*By Samuel Bradbury, M.D. Chicago: University of Chicago Press, 1937. 83 pp. Price, \$1.00.*

Much has been said and a great deal written about the cost of medical care and of the inequality of distribution of medical service for the people of the United States. There has been some confusion, however, as to the actual cost of adequate medical care.

This book, written by a practising Philadelphia physician, presents in 12 chapters, 13 important tables, and 9 indices, an interesting picture of what these actual costs are, based upon studies of schedules of fees charged by general practitioners, surgeons, specialists, hospital laboratories, etc.

Chapters are devoted to the ex-

pectancy of illness, to the type of practitioner and kind of service required and the cost for the individual and family for the treatment of certain specific diseases thoroughly analyzed. Good medical care is properly defined and the principle stressed that medical care of high quality cannot be furnished cheaply.

The amount of fact-finding contained should particularly appeal to the medical profession, administrators, social workers and all who are genuinely interested in the subject of medical economics. CHARLES F. WILINSKY

A Pediatrician in Search of Mental Hygiene—By Bronson Crothers, M.D. New York: Commonwealth Fund, 1937. 271 pp. Price, \$2.00.

But we doubt if he found it! We fear he was searching for the "will-o-the-wisp" and, to boot, quixotically tilting at windmills.

This is a vexatious little book—both because of things it says and those it leaves unsaid. Had the author defined psychiatry *and* mental hygiene he would not have had the need to knock down so many straw men. And also, had he realized that a mental concept does not correspond to any objective reality he would not be looking for the "whole child in a total environment."

In view of the above, one is not surprised that the author can go on for 236 pages and then write, "In the preceding chapters the reader can easily see that the writer has been constantly drawn toward *psychiatry and mental hygiene* (italics mine) and then has withdrawn again and again."

Undoubtedly the author does represent in his thinking many physicians. This may be paraphrastically stated, "That only is scientific which is materialistic hence psychiatry is at best the art of medicine." The reviewer would question both the concepts scientific and psychiatry when so used.

The author states that the pediatrician's primary responsibility is the treatment of the physical ills of childhood, *i.e.*, the diseases due to physical agents. This thought is basic throughout his discussion. But he is not satisfied with just that. He wishes to make growth and development a more meaningful concept. This is what leads to the groping so poignantly expressed in this book. He has come to see that the child when asked may throw light on his dis-ease, and also that it is well worth while taking the time to elicit facts not discoverable on mere physical examination.

In fact, the author is unquestionably doing a nice piece of work at the Children's Hospital of Boston as the chapter, A Teaching Experiment in Action, shows. We are of the opinion, however, that until the day comes when medical students will receive more adequate training in psychopathology and psychotherapy in a more correlated manner than is generally true at present, such attempts at training internes and residents as described by him are at best make-shifts.

Since we agree with some of the strictures against the psychiatrists in extramural work and the propagandists in mental hygiene societies, we would recommend the reading of this book to all such. Medical students and practicing pediatricians need more clearly formulated material if it is to be of value to them. Teaching pediatricians may find consolation in knowing that a fairly good practical job can be done even though they too, together with many an extramural psychiatrist, still may be in search of mental hygiene. HENRY C. SCHUMACHER

The Family in Health and in Illness—By Florence Brown Sherbon, M.D. New York: McGraw-Hill, 1937. 500 pp. Price, \$3.00.

This book was designed as a college

text "to help the young woman student prepare herself for the responsibilities of the family, and incidentally, community life." Its 45 chapters deal with the fundamentals of Family Relationships, Biology, Anatomy, Physiology, Nutrition, Food Chemistry, Public Health, Disease, Bacteriology, Medicine, Nursing, and Emergency Treatments.

The subject matter is presented, not for the technically trained student of medicine, nursing, or dietetics, but for the home maker who has had training in the basic sciences and in Home Economics. Special attention is given to prevention of disease and of accidents; emergency treatments; improvised equipment for nursing; and to entertainment and occupation of the sick. Sick room procedures are presented in a way to enable the home maker to carry out the physician's orders in a scientific and safe manner.

The strongest feature of the book is the excellent manner in which it is illustrated, having 200 figures in all, including diagrammatic drawings, charts, and photographs. These both clarify and create interest in the subject matter. The list of good references at the end of each chapter should be helpful to both teacher and student; and the clear, concise definitions of the new technical terms at the beginning of each chapter would be a great help to the student.

As far as subject matter is concerned, there seems to be very little presented that is really new in any of the many fields discussed. I find nothing whatever new in the chapters dealing with food needs, chemistry of foods, minerals, vitamins, diets, feeding the sick, and emergency treatments. Also, instead of selecting a few important facts and expressing them in simple, concise style, there is some poorly chosen material. For instance

in the chapter on "Food Needs," the author does not show *through what articles of diet* the needs of the body, as presented, may be satisfied; likewise, in the chapter on "Feeding the Sick," and in the one on "The Chemistry of Foods," *no principles of food preparation are stated*. It seems also that more material, not too technical could have been included on *diet* in disease, if this book is to be used by home economics trained home makers.

In the chapters dealing with nutrition, some loose statements, often misleading or confusing are made, such as in Chapter VIII, "a safe, practical rule for the active person in normal health is to eat meat *not over once daily*"; in Chapter IX, "potassium combining with the sodium in such a way as to remove it from the body," and "thyroid, is devoted exclusively to the regulation of iodine metabolism." Similar quotations might be taken from Chapter X.

In spite of these criticisms, *The Family in Health and in Illness* is without question the best book which has been written for use as a textbook for college courses in home care of the sick, and it certainly fills a long felt need in home economics work.

JESSIE ALICE CLINE

**Health Education of the Public:
A Practical Manual of Technic—
By W. W. Bauer, M.D., and Thomas
G. Hull, Ph.D. Philadelphia: Saunders.
227 pp. Price, \$2.50.**

"Out of the experiences of many workers there has grown up a formidable mass of knowledge and experience. It is now possible to state with considerable definiteness what are the functions, the purposes, the advantages, the disadvantages of the several media which are available to the health educator." The aim of this text is to expound these potentialities in a field of education, and of health, that has been little understood, little emphasized, and usually poorly taught. Most "health educators," like Topsy, have "just growed."

The text starts with a chapter on "Definitions and Objectives." This lays the foundation for succeeding chapters on such topics as source of materials, means—for example the radio, exhibits, meetings, pamphlets, newspapers, motion pictures, and other devices and aids to publicity.

Just as the poor teacher under criticism told his high school principal that "he could teach them all night if he could get them to listen," so the major problem of the health educator is to "get them to listen."

This text presents a world of suggestions as to material and methods. It will be of great aid to those responsible for spreading the gospel of health—continually and almost continuously threatened with smothering by the noxious waves of misinformation put out by advertisers through the same media as suggested in this splendid discussion.

It seems to be a case of "fighting fire with fire." Any teacher is faced with three basic questions, upon the proper answering of which the satisfactory solution of his problem depends: whom am I going to teach? What am I going to teach? How am I going to teach? This text places before us the means of answering "what" and "how."

CHARLES H. KEENE

Your Diet and Your Health—By Morris Fishbein, M.D. New York: McGraw-Hill, 1937. 298 pp. Price, \$2.50.

With his usual clarity and felicity of expression, Dr. Fishbein has written an interesting and instructive book on diet for the general reader. In it he presents in popular language the latest authentic facts about the newer knowledge of nutrition, debunks the weird theories of some of the more blatant faddists, and discusses such pregnant topics as reducing, food sensitivities,

and diets in disease conditions, although the last is necessarily somewhat sketchy. Special chapters are devoted to the more important food categories, milk and its products, bread, meat, fish, vegetables, and fruits. An appendix gives valuable data on foods and diets, and there is a good index. This book should serve a useful purpose in helping to inform the public about the essential rôle of diet in the promotion and maintenance of good health. For that purpose it can be highly recommended.

JAMES A. TOBEY

New Light on Delinquency and Its Treatment—By William Healy, M.D., and Augusta F. Bronner, Ph.D. New Haven: Yale University Press, 1936. 226 pp. Price, \$2.00.

Again we are indebted to the authors of this book, for an outstanding contribution to the understanding and treatment of varying problems relative to delinquency.

The basis of this study is a long-term critical analysis of factors making for and against delinquency tendencies and behavior in 105 delinquents compared with 105 children controls belonging to the same family. Of particular interest is a discriminating study of 8 pairs of twins, one of each pair in each instance being a delinquent. The study of this unique material has led the authors to formulate their pivotal conclusion: that the nucleus of delinquent behavior is symptomatic of profound emotional disturbance ingrained by virtue of early life experiences in the life of the delinquent child.

The value of the book is enhanced by the inclusion of representative case material which clearly illustrates various aspects of the problems of delinquency. Of significance is the emphasis which the authors place upon the importance of prevention in delinquency programs. Substance is given to this hope by supplying methodology which

goes with factual material to justify conclusions and generalizations.

The contents are concerned with chapters upon new orientations and the significance of delinquency, introduction to research, the significance of taking the family instead of the delinquent as the unit of research, comparison of emotional experiences of delinquency versus controls, treatment program together with outcomes and new orientation for treatment and their correlations, and, finally, some practical implications of this particular research.

These pioneers and leaders in the field of delinquency have made a most significant contribution in this research which was intended for the Institute of Human Relations of Yale University. Teachers, social workers, juvenile court judges, probation officers, psychiatrists, and all professional lay persons desiring a fundamental grasp of up-to-date conceptions and methodology of delinquency can do no better than to read this timely contribution.

FREDERICK L. PATRY

A Handbook of Accepted Remedies—Edited by P. J. Hanzlik, M.D. (2nd ed.). San Francisco, Calif.: Department of Public Health. Published by J. W. Stacey, Inc., 1937. 115 pp. Price, \$1.50.

The first edition of this exceptionally good handbook was rapidly exhausted. The second edition has been brought up to date and maintains the high standard set by the first. A number of new items have been added. Like the first edition, this can be highly recommended in its field.

MAZÛCK P. RAVENEL

Maternal Deaths: The Ways to Prevention—By Iago Galdston, M.D. New York: Commonwealth Fund, 1937. 115 pp. Price, \$.75 cloth, \$.50 paper.
Dr. Galdston has performed a valu-

able public service in bringing together and reducing to words of one and two syllables the mass of data gathered during recent years on the controversial subject of maternal mortality. He has clothed the subject in non-technical language. Brevity, clarity, and authenticity characterize the book. In this concise form it is readily understandable by the laity. It has a place also in the hands of social workers, nurses, hospital administrators, and all others engaged in public health work.

The book should lead to individual and community action to put an end to the reprehensible maternal morbidity and mortality in this country. The author succinctly states in the foreword that—

Maternal mortality and morbidity cannot be materially reduced by the efforts of the medical profession alone. The problem must be understood and a solution sought by every individual and every organization interested in public health and in public welfare.

Chapters on the preventable deaths, prenatal care, the attendant at delivery, midwife practice, place of delivery, operative versus spontaneous delivery, Caesarean section, abortion, etc., appear in logical sequence. The concluding chapter on what can be done about it is especially practical and helpful. An appendix is devoted to a consideration of the community organization in Cleveland for obstetrical service in hospitals and the antepartum group instruction to mothers sponsored by the Cleveland Academy of Medicine and the Child Health Association.

RICHARD A. BOLT

Diseases of the Nervous System in Infancy. Childhood and Adolescence—By Frank R. Ford, M.D. Baltimore: Thomas, 1937. 953 pp. Price, \$8.50.

Fairness to this opus cannot be given by means of an all-inclusive summary.

It has become necessary to consider each portion separately in the form of a chapter review.

In chapter I, three major divisions have been chosen: nervous diseases due to: (1) Congenital origin, including birth injuries and prenatal defects of development; (2) Those of acute onset—chiefly the encephalitides; (3) Insidious, slow onset—heredo-degenerative diseases, chronic infectious processes and most brain tumors, disturbances of the sympathetic-autonomic system, including: sweating, salivation, disturbances of visceral innervation and vasomotor conditions. This chapter ends with a discussion of the advances in the last ten years in the testing of the autonomic system.

The heading of Chapter II, *Clinical Aspects of the Anatomy and Physiology of the Nervous System*, immediately attracts attention. The opening paragraph says that here is something different. The detailed anatomy and development are to be relegated to the proper textbooks. These will be described only as need be to clarify aspects of clinical importance. The embryological development and function of the nervous system is described with the clarifying use of Dr. Meyer's terminology of "segmental apparatus" and "suprasegmental structures."

The ten pages devoted to the anatomical consideration of the arterio-venous system are worth more through condensation than many times more pages in some anatomy texts.

Prenatal Diseases of the Nervous System are conveniently divided in Chapter III. Those due to absence or incomplete formation and those diseases in which the nervous system has developed to a certain point at which there has been a destruction of the nervous tissue. The author endeavors to point out the difficult differentiation between these diseases and the heredo-degenerative diseases: he further elabo-

rates this differentiation in the following chapter. The insidious, progressive nature of the latter is stressed. In distinguishing these he says that generally the evidence of morbid heredity is not nearly so convincing as in the progressive degenerations. The classification offered is based upon defects of anatomical development. Briefly these are: defects due to closure of midline structures (cerebral and spinal cord), absences and defects of centers, neurons, ganglia and hypertrophies.

It should be said that in Chapter V, on *Infections and Parasitic Invasions of the Nervous System*, as throughout the book, can be seen a conservative yet a thoroughly critical view. This can better be judged by reading the compact condensation of the recent and voluminous literature which is presented. One can see in subject after subject the crystalline substance of innumerable authoritative works. It should be emphasized that time and again a topic has been presented as adequately in a short space as could be gotten from laborious search through many journals and texts. This should more than appeal to the physician who wants to know what the disease may be and also wants to know more about it. He will be able to find just that in this book. The author does not agree with certain European writers "that it is justifiable to attribute congenital defects of the nervous system to syphilis, unless there are serological or other evidences of the active disease."

Chapter IX is titled *Injuries of the Nervous System by Physical Agents*. The most important are the birth injuries. Pressure phenomena due to bony malformations are considered. Finally are included the rarer but interesting effects of radium, roentgen rays, lightning and electric shock and intense sunlight. The discussion of cerebral birth injuries is particularly interesting because of the great amount

of the author's personal experience which is represented. Breech deliveries and prematures show especially high incidence for injuries.

In his concluding chapter the author considers clinical findings; he groups the signs in such a way that the etiology is suggested. We find hemiplegias which may be of congenital origin, those caused by birth injuries, acute infectious diseases, primary infections of the brain, neoplasms, degenerative conditions—each one suggestive in view of the history. Muscular atrophies, spasticities, ataxias, involuntary movements, pain and disorders of sensibility, coma, convulsive phenomena, disorders of speech function, nystagmus, disturbance of behavior are all thus discussed in this final chapter. It is a consummating chapter for which the pediatrician and general practitioner have hoped many years.

Finally a word must be said regarding the well chosen, illustrative photographs, charts, tables, and case histories which do much to make the use of this book a pleasure rather than an "I-suppose-I-should" text. Another feature to be recommended is the position of the bibliography; this will be found immediately following the subject under discussion. In this particular matter a short quotation from the preface will better illustrate a consideration which Dr. Ford has shown throughout the book—"Short bibliographies are appended. In the selection of references, I have favored those which are written in English and which are easily available." Little more need be said for an author who has been chosen by Dr. Brennemann to represent the field of neurology in his "Practise of Pediatrics."

W. F. SCHNEIDER

Board Members' Manual—Prepared by the National Organization for Public Health Nursing, Inc. (2nd ed.)

New York: Macmillan, 1937. 157 pp. Price, \$1.50.

Since 1930 when the *Board Members' Manual* was first published, it has been used extensively as a guide for both administrators and board members of voluntary public health nursing agencies. With the increasing importance in the last few years of the nursing services of official agencies there have developed in many localities lay committees whose purpose is to act as interpretive or advisory committees to these services. For such committees this newly revised *Manual* should also be of real help as it describes the best administrative practice of agencies, giving in brief form such information as every committee member should have. The qualifications of public health nurses for various types of positions, methods of support, the organization of new services, the function of committees in official and private agencies, the use of volunteers, relationships with medical and other professional services, personnel policies—these are but some of the many topics discussed.

New committee members will find this a most helpful guide book. Experienced workers to whom the first edition was well known will find fresh material since the book was completely rewritten by the committee. Health officers and nursing administrators will find the brief discussions and carefully assembled information of real value in their work with lay groups. The reviewer congratulates the N.O.P.H.N. and the Manual Committee on the splendid piece of work which they have accomplished.

KATHARINE FAVILLE

Nutrition: Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy. New York: Col-

umbia University Press, 1937. 327 pp. Price, \$2.00.

Among the most valuable and far-reaching activities of the politically impotent League of Nations have been its studies on human nutrition, several of which have been previously reviewed and highly praised in these columns.

This final report of the committee on nutrition, headed by Viscount Astor and including Drs. E. V. McCollum, E. G. Nourse, and Faith Williams, of the United States, consists in part of a brilliant epitome of what is known today about human nutrition and how this knowledge was developed.

Other parts of the report present able discussions of recent trends in food habits throughout the world, with particular reference to consumption, prices, the relation of income and education to nutrition, and the problem of agricultural adaptation to nutritional requirements.

Numerous recommendations for future progress in the improvement of mundane dietetics are a feature of the report. Further scientific study of nutrition problems is urged, and continuous education of professional groups and the general populace in the principles of the optimum diet is advocated.

The report emphasizes the need for the greater use of protective and energy-bearing foods in the daily diet of all persons, recommending that liberal amounts of milk and dairy products, eggs, meat, green and leafy vegetables, fruit, cod liver oil and other fish liver oils be used, along with bread, wheat cereals, and potatoes. The ex-

cessive use of sugar is strongly condemned.

This very well written and attractively printed report should prove of great practical value to all who are concerned in any way with the problem of nutrition and its relation to the health and well-being of the people.

JAMES A. TOBEY

Bacteriology: A Text-Book of Microorganisms — By Fred Wilbur Tanner (3rd ed., rev.). New York: John Wiley, 1937. 510 pp. Price, \$3.50.

This is a third edition which follows the plan of the previous ones. It is designed for general students of academic subjects. An entire chapter is devoted to the nomenclature and classification of bacteria. We have always thought this was a mistake as the whole subject is very far from having been satisfactorily settled, and much of the material constitutes a useless burden on the minds of the beginner.

There is a great deal of practical information in the book on water bacteriology, sewage treatment, bacteriology of milk and milk products, the use of bacteria in the industrial processes in which fermentation is a feature. The chapter on home canning and industrial preservation of foods is interesting and useful.

The book ends with a Glossary which is useful in some respects, but has mistakes. Professor Tanner has large classes and has evidently found the book of use. MAZÛCK P. RAVENEL

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Available Data about Sludge as Fertilizer—Dried sludge is a practical source of fertilizer and each sewage works operator should popularize its use by florists, farmers, and gardeners. There is much research needed along this line and agricultural experiment stations might well help. These and much else are the conclusions of the A.P.H.A. Committee on Sewage Disposal.

ANON. Committee Report. The Utilization of Sewage Sludge as Fertilizer. Sewage Works J. 9, 6:861 (Nov.), 1937.

Call for Action—As a result of conferences between committees of the A.P.H.A. and A.M.A., the Board of Trustees of the latter adopted a resolution urging local medical societies to assume leadership in determining the need for both medical and public health services and to develop procedures for meeting these needs.

ANON. Medical Care for All the People. J.A.M.A. 110, 3:212 (Jan. 15), 1938.

Historical Note—Tulare County has its first reported case of tularemia. Looking for plague in 1910, two U. S. Public Health Service Officers ran across a new germ in ground squirrels caught there, which they named *B. tularensis*, because of the location. Later, Francis found "deer fly fever" in Utah to be the result of infection with the same germ; hence he named the disease tularemia. Now the chicken has come home to roost.

ANON. Tulare County Has First Tularemia Case. Weekly Bull. California State Dept. of Health. 16. 51:203 (Jan. 15), 1938.

Federal Health Services—Reasons for the establishment of a federal health department are convincingly set forth in this detailed study made by the Bureau of Legal Medicine of the A.M.A. As federal expenditures for health exceed \$100,000,000 annually, it would seem logical that the activities be efficiently organized. If you think so, it would be well to write to the listed committee members to tell them so.

ANON. Why a United States Department of Health. J.A.M.A. 110, 4:25B (Jan. 22), 1938.

Nursing Theory and Practice—In theory, the home visit of the public health nurse presents the most promising opportunity to ascertain family health needs and to assist in solving the discovered health problems. The nursing services of three rural counties were reviewed to observe how nearly the nurse's practice approximated these objectives. The conclusion is that the nurses did not render a diversified service in the home visits, so health administrators are invited to examine their nursing programs with a view to attaining these stated objectives.

BEAN, H., and BROCKETT, G. S. The Family as a Unit for Nursing Service. Pub. Health Rep. 52, 53:1923 (Dec. 31), 1937.

Typhus, Rats, Mice, et al.—Endemic typhus is increasing in South-eastern United States. A field mouse trapped in Alabama was found infected with the disease, and it is known that 8 other animals, mostly rodents, are susceptible.

BRIGHAM, G. D., and DYER, R. E. Endemic Typhus Fever in Native Rodents. J.A.M.A. 110, 3:180 (Jan. 15), 1938.

Understanding Youth — Mostly about relating local health services to health education in secondary schools, this paper contains much good for teachers and sanitarians alike.

CONNOLLY, M. P. Sources and Uses of Health Material. J. Health & Phys. Ed. 8, 10:596 (Dec.), 1937, and Pub. Health Nurs. 30, 1:22 (Jan.), 1938.

Latest Word about Colds—Virus from patients with influenza is pathogenic for ferrets and can be cultivated in an aerobic medium, whereas virus from patients with colds does not produce an infection in ferrets and can be cultivated only in an anaerobic medium. Immune substances against the influenza virus have been demonstrated, but as yet, protection against colds has failed to materialize. This paper should be studied well.

DOCHEZ, A. R., *et al.* Filtrable Viruses in Infection of the Upper Respiratory Tract. J.A.M.A. 110, 3:177 (Jan. 15), 1938.

Bending the Twig Re Alcohol—Teaching about alcohol and other drugs should be based upon acquaintance with the essentials of growth and bodily functions, which should precede the presentation of effects upon behavior. Personal choice should be based upon education, not duress. Example is important, for teaching without conviction is unsound. It would be difficult to disagree with this excellent paper.

EMERSON, H. Alcohol and Narcotic Drugs. J. Health & Phys. Ed. 8, 10:588 (Dec.), 1937.

It Depends on the Flea—Of the fleas that transmit plague, the rat flea, *cheopsis*, is the one which does the most damage, but the infection kills the flea as quickly as it does rats and men. Some other varieties of fleas, though

they can transmit the disease, do so less easily and themselves survive the infection for longer periods. This seems to account for the slow, smouldering infections in this country which rarely affect humans. An interesting exposition.

ESKEY, C. R. Recent Developments in Our Knowledge of Plague Transmission. Pub. Health Rep. 53, 2:49 (Jan. 14), 1938.

Selling British Health Services—Modestly acknowledging the British health service to be the best in the world, this author points to the fact that less than half the mothers visit antenatal clinics, a third of all infants fail to attend infant welfare centers, and only two-thirds of the school children needing dental treatment get it. This indicates lack of public appreciation of health services, and the outstanding immediate public health objective is to remedy it.

FENTON, J. Knowledge Is the Key to Health. J. Roy. San. Inst. 1, 4:221 (Jan.), 1938.

Credit Where Due—High point of this British paper is the table showing decline in diphtheria deaths in New York contrasted with the continuing high mortality in London. In 50 large British communities, an estimated "immunized" rate of 5 per cent of the total child population is reported.

FORBES, J. G. Progress of Diphtheria Prevention. Brit. M. J., Dec. 18, 1937, p. 1209.

Rheumatic Hearts—If as many cases of polio occurred in any northern city as there are cases of rheumatic heart disease found normally in the hospitals of the same city, what scare headlines we should see! Yet the latter is one of the major public health problems, however apathetic health officials and parents alike may be about it. If the disease were properly reported, both the public and officialdom would be aware of its seriousness, for

it would be exceeded as a cause of death only by tuberculosis, pneumonia, and syphilis, among the communicable diseases.

HEDLEY, O. F. Mortality from Rheumatic Heart Disease in Philadelphia during 1936. *Pub. Health Rep.* 52, 53:1907 (Dec. 31), 1937.

Negro Health in Large Cities—Illnesses which caused incapacity for at least a week were 43 per cent higher among Negroes than similar groups of white residents in 4 large cities. Among both races improved living status decreased the incidence of illness. Low economic status hence may account for much of the higher Negro disability rate.

HOLLAND, D. F., and PERROTT, G. St. J. Health of the Negro. *Milbank Quart.* 16, 1:5 (Jan.), 1938.

Class Differences in Birth Rates—Standardized birth rates were lowest in the \$2,000 to \$3,000 family income class in this survey conducted in 5 large cities and including 16,831 married women of childbearing age. Higher income families had more children, as did those under \$2,000. The relievers were most prolific. Professional groups do better by the country than the business class. Page Mussolini!

KISER, C. V. Variations in Birth Rates According to Occupational Status, Family Income, and Educational Attainment. *Milbank Quart.* 16, 1:39 (Jan.), 1938.

What We Know about Polio—This disconcerting review of the many vacant spots in our knowledge of the prevention of poliomyelitis ends with a warning applicable to other public health situations. In effect, the author says that the public should realize how little science knows of the essential facts of poliomyelitis, and should be spared the premature publication of half truths, or no truths.

LONDON, J. F. Poliomyelitis. *New York State J. Med.* 38, 1:1 (Jan. 1), 1938.

From Jenner to Social Security—An engaging presentation of the development of public health through the protozoan and prevertebrate epochs, the eras of fumigation and environmental sanitation, then the ages of immunization and personal hygiene up to the "homo sapiens" stage.

MILLER, K. E. The Evolution of Public Health. *Health Officer.* 2, 8:353 (Dec.), 1937.

Public Schools and Health—What is wrong with New York City schools from the standpoint of the health of the school child is likely to be more or less true of other city systems. As the suggested improvements probably apply elsewhere, the paper might well be read by all who have to do with school child health.

ROSENSON, W. Neglected Health Factors in Public Schools. *New York State J. Med.* 3, 1:7 (Jan. 1), 1938.

Raw Pork Eaters Are Many—Evidence is presented which indicates an incidence of trichinosis among United States adults of about 1 in 5.

SCHEIFLEY, C. H. The Prevalence of Trichinosis. *Am. J. Hyg.* 27, 1:142 (Jan.), 1938.

Will Influenza Immunization Come?—Evidence is presented of the immunizing properties of influenza vaccines prepared from chick embryo virus cultures. Although protection is afforded by intramuscular injections, it is not known how long the immunity persists.

STOKES, J., JR., *et al.* Vaccination Against Epidemic Influenza with Active Virus of Human Influenza. *Am. J. M. Sci.* 104, 6:757 (Dec.), 1937.

Health Education in School and Community—Discussed here and in a succeeding issue are the qualifications and training of elementary and secondary school teachers in matters of health,

the nature of training for school health supervision, and the administration of general health education programs.

TURNER, C. E., and RILEY, P. L. *The Training of the Health Educator*. J. Health & Phys. Ed. 9, 1:13 (Jan.), 1938.

About Abortions—In this typical cross-section of the general population,

15 per cent of all pregnancies were found to terminate in abortion; the rate in rural areas was less, but not greatly different from the urban; about 5 per cent are induced abortions, 10 per cent spontaneous.

WIEHL, D. G. *A Summary of Data on Reported Incidence of Abortion*. Milbank Quart. 16, 1:80 (Jan.), 1938.

BOOKS RECEIVED

PRACTICAL BACTERIOLOGY, HAEMATOLOGY AND ANIMAL PARASITOLOGY. 9th ed. By E. R. Stitt, Paul W. Clough and Mildred C. Clough. Philadelphia: Blakiston, 1938. 961 pp. Price, \$7.00.

GRAPHS. HOW TO MAKE AND USE THEM. By Herbert Arkin and Raymond R. Colton. New York: Harper, 1936. 224 pp. Price, \$3.00.

THE CONQUEST OF CHOLERA. AMERICA'S GREATEST SCOURGE. By J. S. Chambers. New York: Macmillan, 1938. 366 pp. Price, \$4.75.

DISEASE AND THE MAN. By Roger F. Lapham. New York: Oxford University Press, 1937. 143 pp. Price, \$2.00.

A TEXTBOOK OF HEMATOLOGY. By William Magner. Philadelphia: Blakiston, 1938. 395 pp. Price, \$4.50.

LEGAL MEDICINE AND TOXICOLOGY. By Thomas A. Gonzales, Morgan Vance and Milton Helpern. New York: Appleton-Century, 1937.

DAIRY BACTERIOLOGY. 2d ed. By Bernard W. Hammer. New York: Wiley, 1938. 482 pp. Price, \$5.00.

LECTURES ON THE EPIDEMIOLOGY AND CONTROL OF SYPHILIS, TUBERCULOSIS, AND WHOOPING COUGH, AND OTHER ASPECTS OF INFECTIOUS DISEASES. By Thorvald Madsen. Baltimore: Williams & Wilkins, 1937. 216 pp. Price, \$3.00.

SCIENCE IN OUR LIVES. By Benjamin C. Gruenberg and Samuel P. Unzicker. Yonkers: World Book Co., 1938. 750 pp. Price, \$1.76.

MANUAL OF PSYCHIATRY AND MENTAL HYGIENE. 7th ed. By Aaron J. Rosanoff. New York: Wiley, 1938. 1091 pp. Price, \$7.50.

THE FIGHT FOR LIFE. By Paul de Kruif. New York: Harcourt Brace, 1938. 342 pp. Price, \$3.00.

DAS LEBEN DER FRAU. By Bruno Gebhard. Stuttgart: Union Deutsche Verlagsgesellschaft Stuttgart, 1937, 231 pp. Price, \$5.00.

FIFTH AVENUE TO FARM. A Biological Approach to the Problem of the Survival of

Our Civilization. By Frank Fritts and Ralph W. Gwinn. New York: Harper, 1938. 282 pp. Price, \$3.00.

THE FOUNDATIONS OF NUTRITION. By Mary Swartz Rose. New York: Macmillan, 1938. 625 pp. Price, \$3.50.

REPORT ON THE BRITISH HEALTH SERVICES. By the Health Group of P.E.P. London: P.E.P., 1937. 430 pp. Price, \$3.00.

GOOD HOUSEKEEPING AND SAFETY IN THE FOUNDRY INDUSTRIAL CODES AND OCCUPATIONAL DISEASE LEGISLATION. Chicago: American Foundrymen's Assoc., 1937. 61 pp. Price, \$1.50.

REPORT ON EIGHTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, BRUSSELS, BELGIUM, JUNE 27-JULY 3, 1935. Report of Captain William Seaman Bainbridge. Washington: Government Printing Office, 1937. 114 pp. Price, \$1.00.

THE ART AND SCIENCE OF MARRIAGE. By Esther B. Tietz and Charles K. Weichert. New York: McGraw-Hill, 1938. 279 pp. Price, \$2.50.

THE EXPECTANT FATHER'S HANDBOOK. By David Victor. Indianapolis: Bobbs Merrill, 1938. 170 pp. Price, \$1.50.

WE AND OUR NEIGHBORS. A Welfare Primer. By Buffalo Council of Social Agencies. New York: Community Chests and Councils, 1937. 84 pp. Price, \$75.

JOURNAL OF MILK TECHNOLOGY. Vol. 1, Number 1. Published by Special Committee on Association Publication of the International Association of Milk Sanitarians, Orange, N. J., 1937. Membership with Journal \$5.00.

A CENTURY OF BOOK PUBLISHING, 1838-1938. By John Barnes Pratt. New York: Barnes, 1938. 56 pp.

THE BIOLOGY OF PNEUMOCOCCUS. By Benjamin White. New York: Commonwealth Fund, 1938. 799 pp. Price, \$4.50.

ORGANIZING THE COMMUNITY FOR DELINQUENCY PREVENTION. New York: Community Chests and Councils, 1937. 27 pp. Price, \$5.00.

ASSOCIATION NEWS

OFFICERS AND EXECUTIVE COMMITTEE KANSAS CITY ANNUAL MEETING

DR. Edwin Henry Schorer, Chairman of the Local Committee on Arrangements for the Sixty-seventh Annual Meeting of the Association, to be held in Kansas City, Mo., October 25-28, announces the following appointments of officers and chairmen of sub-committees working for the success of the convention:

Honorable Bryce B. Smith.....Honorary Chairman
Mayor of Kansas City, Mo.
Honorable Don. C. McCombs.....Honorary Chairman
Mayor of Kansas City, Kans.
Edwin Henry Schorer, M.D.....Local Chairman
Director of Health, Kansas City, Mo.
Ralph Duncan, M.D.....Vice-Chairman
Commissioner of Laboratories, Health Department
Otto Murphy.....Vice-Chairman
Commissioner of Inspection & Sanitation
Albert Jewell.....Secretary
Health Conservation Association
William F. Lunsford, M.D.....Treasurer
Director of Health, Kansas City, Kans.
Merl P. Moon, Ph.D.....
President-Elect, Missouri Public Health Association

Chairmen

Edward H. Skinner, M.D.....Finance Committee
Jackson County Medical Society
Ira H. Lockwood, M.D.....Reception Committee
President, Jackson County Medical Society
Morris Ginsberg, M.D.....Publicity Committee
Health Conservation Association
Carl Ferris, M.D.....Radio Committee
Jackson County Medical Society
Max Goldman, M.D.....Meeting Rooms Committee
Jackson County Medical Society
H. E. Boning, Jr.....Registration Committee
Manager, Convention Bureau
E. L. Filby.....Scientific Trips Committee
Associate Engineer, Black & Veatch
Frank Houston.....Entertainment Committee
Account Executive, Potts Advertising Company
Mrs. Samuel Sawyer.....Ladies Entertainment Committee
President, Visiting Nurses Association
John Williams, Jr., M.D.....Membership and Attendance Committee
Missouri State Board of Health
E. K. Musson, M.D.....Membership and Attendance Committee
Kansas State Board of Health
Edward A. Plowman.....Transportation Committee
Supt., Motor Section, Health Department
Ralph E. Duncan, M.D.....Housing Committee
Commissioner of Laboratories, Health Department
Otto Murphy.....Scientific Exhibits Committee
Commissioner of Inspection and Sanitation,
Health Department

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

- George M. Brother, M.D., 204 S. High St., Rising Sun, Ind., Director, Fourth District Health Dept.
- William W. Fuller, M.D., Health Department, Christiansburg, Va., Montgomery County Health Officer
- Elsworth L. Gardner, M.D., Courthouse, Eugene, Ore., City and County Health Officer
- Abraham Gelperin, M.D., 306 Northern Ave., Cincinnati, O., District Physician, Dept. of Health
- Edgar M. Griffith, M.D., Harrisonville, Mo., Director, Cass County Public Health Unit
- F. Sydney Hansen, M.D., City Hall, Pendleton, Ore., County Health Officer
- Joseph L. Hundley, M.D., Wytheville, Va., Wythe County Health Officer
- James Murphy, M.D., 101 Broad St., Middletown, Conn., President, City Health Board
- Samuel B. Osgood, M.D., County Court House, Grants Pass, Ore., Josephine County Health Officer
- J. A. Outland, M.D., Murray, Ky., Calloway County Health Officer
- Vincenzo Pascale, M.D., 38 W. 10 St., New York, N. Y., Medical Inspector and Chief, Bureau of Social Hygiene, Staten Island Case Finding Project, New York City Dept. of Health
- C. L. Putnam, M.D., State Dept. of Health, Des Moines, Ia., Field Representative and Medical Director, District No. 111
- Frederick M. Rauch, M.D., Mohegan Lake, N. Y., Health Officer, Putnam Valley
- William C. Treder, M.D., 138 Mohawk Ave., Scotia, N. Y., Commissioner of Health, Schenectady
- James P. Ward, M.D., Charleston, Miss., Director, Tallahatchie County Health Dept.
- Jabez H. Williams, M.D., Clinton, N. C., Sampson County Health Officer

Laboratory Section

- Frieda Canvel, 10434 Hebron Lane, West Los Angeles, Calif., Bacteriologist, Grade 1, Los Angeles County Health Dept.
- Francis E. Council, M.D., 615 N. Wolfe St., Baltimore, Md., on leave (Captain, Medical Corps, U. S. Army)
- Marjory W. Ellison, 2215 Belmont Blvd., Nashville, Tenn., Technician, Diagnostic Section, State Laboratory

- John P. Greze, Jr., Zonite Products Corp., New Brunswick, N. J., Bacteriologist
- Rowland A. Grote, 807 E. 30 St., Austin, Tex., Pharmacist, Bureau of Laboratories, State Dept. of Health
- Charles A. Hunter, Ph.D., Washburn College, Topeka, Kans., Director, Public Health Laboratories, State Board of Health
- Edward G. Hoffman, Nez Perce County Health Unit, Lewiston, Idaho, Laboratory Technician, North Central Health District
- Blanche Kosecoff, Dept. of Health Laboratories, Ft. of E. 16 St., New York, N. Y., Laboratory Assistant
- Clara S. Lehmberg, State Board of Health, Phoenix, Ariz., X-ray Technician, Mobile Unit
- Samuel L. Leiboff, 1315 Clinton Ave., New York, N. Y., Director, New York Pathological and X-ray Laboratory; Biochemist, Lebanon Hospital
- Howard E. Lind, C.P.H., St. Louis County Health Dept., Clayton, Mo., Director, Bacteriology Laboratory
- Nicholas A. Milone, State Dept. of Health, Albany, N. Y., Junior Sanitarian, Bureau of Milk Sanitation
- Theodore Mitschke, 200 Percival Ave., Kensington, Conn., Laboratorian in Charge, U. S. Veterans' Administration Facility
- Frank P. Pauls, 2521 Durant Ave., Berkeley, Calif., Malaria Microscopist, State Dept. of Public Health
- Isabella B. Romans, 39 W. 38 St., New York, N. Y., Research Bacteriologist, Pease Laboratories
- Virginia Wilson, 507 E. Capitol, Jefferson City, Mo., Laboratory Technician, State Board of Health

Vital Statistics Section

- Anne L. Kell, St. John's Rectory, Glyndon, Md., Statistical Clerk, State Dept. of Health
- Anna R. Thomas, 3815 Chamberlayne Ave., Richmond, Va., Principal Statistics Clerk, State Dept. of Health
- Alan E. Treloar, Ph.D., University of Minnesota, Minneapolis, Minn., Assistant Professor of Preventive Medicine and Public Health

Public Health Engineering Section

- Edwin W. Beale, 739 Fourth Ave., San Diego, Calif., Director, Bureau of Sanitary Engineering, Dept. of Health

Morris C. Belsky, 12 Westview St., Dorchester, Mass., Public Health Engineer, CCC, 1st Corps Area, Army Base, Boston

J. Matt Carr, 209 S. Campbell, El Paso, Tex., Sanitary Engineer, City-County Health Unit

Herbert C. Clare, Division of Public Health, Boise, Idaho, Assistant, Sanitary Engineering Staff

Walter W. Hane, 3418 Wilmot Ave., Columbia, S. C., State Sanitary Officer, State Board of Health

Henry C. Liles, City Health Dept., Greensboro, N. C., Milk Inspector

Frederick L. McDonald, State Board of Health, Little Rock, Ark., Chief Sanitary Engineer

Philip E. Nelbach, 310 Cedar St., New Haven, Conn., Field Secretary, Committee on the Hygiene of Housing, American Public Health Association

Rogelio A. Santana, Banos 52 esq. a 3a Habana, Cuba, Water Works and Sewerage Specialist for Secretary of Public Works

Baxter F. Wade, City Health Dept., Greensboro, N. C., Sanitary Engineer

William F. Waller, 89 Mineral Ave., Keyser, W. Va., District Sanitary Officer, State Health Department

Industrial Hygiene Section

George M. Hama, St. Joseph Lead Co., Edwards, N. Y., Industrial Hygiene Engineer

William B. Harris, 84 Horatio St., New York, N. Y., Assistant Industrial Hygiene Mechanical Engineer, State Dept. of Labor

John M. McDonald, M.D., D.P.H., 3515 Denison Rd., Baltimore, Md., Director, Bureau of Occupational Diseases, City Health Dept.

J. P. Russell, M.D., C.P.H., 3093 Life Sciences Bldg., Berkeley, Calif., Director, Industrial Hygiene Service, State Dept. of Health

Food and Nutrition Section

Claude H. Colvin, 709 Press Building, Binghamton, N. Y., Milk Sanitarian, State Dept. of Health

Christopher K. Beebe, 228 S. Wabash Ave., Chicago, Ill., Chemist, Ill. Division of Foods and Dairies

Frederick P. Jaggi, Jr., D.V.M., A. & M. College of Texas, College Station, Tex., Professor and Head, Dept. of Veterinary Hygiene

Julius A. Messina, 100 W. Ostend St., Baltimore, Md., Senior Food Inspector, City Health Dept.

Walter W. Scofield, 12 Hillvista Blvd., Trenton, N. J., Chief, Bureau of Drugs, State Dept. of Health

William R. Webb, 215 North Denver, Tulsa, Okla., Special Representative, Beatrice Creamery Co.

William H. Zimmermann, 1972 E. 33 St., Brooklyn, N. Y., Acting Supervisor in Charge of City Milk Inspection, Dept. of Health

Child Hygiene Section

Charlotte A. Stickney, M.D., 1522 Portland Ave., St. Paul, Minn., Pediatrician, Division of Child Hygiene, State Dept. of Health

Public Health Education Section

Wilfred J. Allison, M.D., Southwestern Life Insurance Co., Dallas, Tex., Medical Director

Geraldyn Dismond, 434 Lafayette St., New York, N. Y., Assistant in Health Education, Dept. of Health

Ada E. Gallaway, 621 Forest Ave., Ann Arbor, Mich., Graduate Student

Clarence J. Gamble, M.D., 103 Canton Ave., Milton, Mass., Medical Field Director, Birth Control Clinical Research Bureau

Mrs. Sidney Rosenwasser, 332 Rogers Ave., Brooklyn, N. Y., Assistant in Health Education, Dept. of Health

William G. Payne, 716 E. Pierce St., Phoenix, Ariz., Public Health Instructor, Phoenix Union High School

Public Health Nursing Section

Rose L. Allen, 87 Mitchell Dr., Phoenix, Ariz., County Nurse, Maricopa County Health Unit

Nellie G. Baldwin, R.N., 502 N. Main St., Elk City, Okla., Tuberculosis Field Nurse, State Health Dept.

Lavinia Baskin, R.N., Moncks Corner, S. C., County Nurse, Berkeley County Health Dept.

Elma Bergey, Frankfort, Mich., County Nurse, Benzie County Children's Fund of Michigan

Evelyn Buck, R.N., Department of Health, Detroit, Mich., Supervisor, Division of Child Welfare Nursing

Margaret V. Bynum, 1213 1/2 W. Adams, Phoenix, Ariz., Public Health Nurse, Maricopa County Health Unit

Beulah R. Daniel, R.N., Box 271, Perry, Ga., District Advisory Nurse, State Board of Health

Lois M. Enright, 528 W. 111 St., New York, N. Y., Staff Nurse, Henry Street Visiting Nurse Service

Helen Fisher, 1307 S. W. Broadway, Portland, Ore., Supervisor of School Nurses, Bureau of Health

Wealtha M. Goode, R.N., 340 W. Second, El Dorado, Ark., Public Health Nurse, Union County Health Dept.

Margaret Goodman, 1027 E. Palm Lane, Phoenix, Ariz., School Nurse, Maricopa County Health Unit

Clarice M. Harper, R.N., Box 1201, Buckeye, Ariz., Staff Nurse, Maricopa County Health Unit

Juanita Johnston, R.N., 614 W. 3rd, Albany, Ore., Albany School Nursing, Director of Health Education

Marie Kass, R.N., 692 Wisconsin St., San Francisco, Calif., Field Nurse, Dept. of Public Health

Florence R. Laird, 2530 N. 8 St., Phoenix, Ariz., Nurse, Maricopa County Health Unit

Florence Manley, R.N., 199 Hodge Ave., Buffalo, N. Y., District State Supervising Nurse, State Dept. of Health

Dorothy Somerville, R.N., Kings County Schools, Hanford, Calif., Supervisor of Child Health and Welfare

Hazel I. Stewart, Almond, N. Y., District Supervising Public Health Nurse, State Dept. of Health

Lillian E. Upham, 411 Court House, Flint, Mich., Supervising Nurse, Genesee County Health Dept.

Clara Valenzuela, 610 N. 3 St., Phoenix, Ariz., Public Health Nurse, Maricopa County Health Unit

Elizabeth Vanden-Bossche, Betsy Barbour House, Ann Arbor, Mich., Student

Una V. Wetherby, 11 E. Newton, Boston, Mass., Public Health Nursing Supervisor, State Dept. of Public Health

Dorothy L. Wise, 294 Washington St., Geneva, N. Y., District State Supervising Nurse, State Dept. of Health

Epidemiology Section

Maurice J. Ansfield, M.D., 238 W. Wisconsin Ave., Milwaukee, Wis., Clinic Physician, Bureau of Communicable Diseases, City Health Dept.

Alfreda Arreaza-Guzman, M.D., 615 N. Wolfe St., Baltimore, Md., Student on leave (Epidemiologist, Ministerio de Sanidad y Asistencia Social, Caracas, Venezuela, S. A.

Kenneth F. Brandon, M.D., City Hall, Vancouver, B. C., Canada, Director, Health Unit No. 3, Metropolitan Health Board

Warren W. Lacey, Jr., M.D., 818 E. 40 St.,

Brooklyn, N. Y., Epidemiologist-in-training, State Dept. of Health

Lester G. Levingson, 615 N. Wolfe St., Baltimore, Md., Student

Moses Silverman, M.D., 702-54 St., Brooklyn, N. Y., Physician in Charge Syphilis Clinic Red Hook Station, Dept. of Health

Unaffiliated

Daniel P. McMahon, M.D., State Dept. of Health, Albany, N. Y., Epidemiologist-in-training

Grover C. Sherrard, M.D., U. S. Quarantine Station, Rosebank, S. I., N. Y., Physician, U. S. Public Health Service

Morris S. Wiener, D.D.S., 1284 St. Johns Pl., Brooklyn, N. Y., Interested in Oral Health Promotion

DECEASED MEMBERS

George P. Barth, M.D., Milwaukee, Wis., Elected Member 1918, Fellow 1928

Lawrason Brown, M.D., Saranac Lake, N. Y., Elected Member 1915, Fellow 1923, Life Member 1929

Charles H. Lawall, Sc.D., Philadelphia, Pa., Elected Member 1914, Fellow 1922

George H. Roth, M.D., Los Angeles, Calif., Elected Member 1920, Fellow 1933

L. J. Zoeller, Ivorydale, O., Elected Member 1930, Fellow 1934

Prof. Theodore J. Bradley, Boston, Mass., Elected Member 1920

William C. Buntin, M.D., Staten Island, N. Y., Elected Member 1936

Marion A. Gleason, M.D., Providence, R. I., Elected Member 1924

Charles H. Hood, D.Sc., Boston, Mass., Elected Member 1913

Charles E. Kaufman, M.D., West Haven, Conn., Elected Member 1935

Charles D. Kline, M.D., Nyack, N. Y., Elected Member 1919

August G. Nolte, Jefferson City, Mo., Elected Member 1937

Gus H. Radebaugh, Urbana, Ill., Elected Member 1933

T. H. Rockwell, M.D., New York, N. Y., Elected Member 1916

DeWitt T. Smith, M.D., Dallas, Tex., Elected Member 1926

Jason Waterman, Washington, D. C., Elected Member 1935

Ada B. Coffey, R.N., New York, N. Y., Elected Member 1931

Henry A. Rowland, Toronto, Ont., Elected Member 1920

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITION AVAILABLE

LOS ANGELES COUNTY CIVIL SERVICE COMMISSION

Assistant Health Officer, Health Department. Open to residents of the United States. Men only. M.D. and possess or able to secure certificate to practise in California; possess certificate or degree in public health from recognized school of public health in the United States; 2 years' recent experience in public health work in administrative capacity. Five years' additional experience may be substituted for public health certificate or degree lacking. Vacancies: One. Age: At least 30 years at date of examination. Salary starts at \$450 per month. (Examination given in Los Angeles only.) Applications must be filed by April 15, 1938.

POSITIONS WANTED

HEALTH OFFICERS

Physician, M.D., University of Maryland; C.P.H., Johns Hopkins; broad experience in county public health administration, will consider opening of better class. A346

Physician, M.D., Western Reserve; short course for health officers, Johns Hopkins; with county and state experience, wishes administrative or epidemiological position; north or west preferred. A349

Physician, M.D., Northwestern University; Dr.P.H., Yale; will consider appointment in general administration, infant welfare or epidemiology. A300

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins and 14 years public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Experienced Health Officer, who has completed Vanderbilt short course, 1936, will consider appointment. West preferred. A320

Physician, M.D., Johns Hopkins; Public Health course at Michigan; experienced in school and city health work, will consider an administrative post in eastern United States. A354

Physician; age 33, M.D., University of Wisconsin; M.P.H., Harvard; specializing in industrial hygiene, will consider general administration. A342

Trained administrator, A.B., M.D., with background of laboratory and research; formerly Assistant Health Commissioner large city. Familiar with all lines. Available short notice. A295

CHILD HYGIENE

Experienced physician, M.D. and Ph.D., University of Minnesota; specially qualified in maternal and child hygiene, directing state and local programs; will consider position of better sort. A238

Woman physician, M.D., Creighton Medical School, with extensive experience in maternal, infant and child hygiene, and special interest in crippled children's service, desires position in field work. C301

Woman physician, M.D., Rush Medical; wishes administrative or clinical position in maternal and child health. C347

Woman physician, M.D., Yale; Dr.P.H., Yale; experienced in pediatrics and administration of state bureau, will consider attractive opening. C348

SANITARY ENGINEERING

Sanitary Engineer, courses at Rutgers University, with 17 years' experience in design, research and construction of water and sewage plants, as well as aerial pollution surveys, desires position, preferably research. E321

Graduate Sanitary Engineer with service under U.S.P.H.S. and State Departments of Health, especially interested in filtration plant design and operation and shellfish sanitation. seeks employment. E356

MISCELLANEOUS

Young woman, M.S.P.H., University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. M303

Young man, at present college teacher of hygiene and physical education and experienced in university medical service, desires position as executive in public or private health organization. M357

NEWS FROM THE FIELD

MODEL ORDINANCES

THE A.P.H.A. Information Service frequently receives requests from health officers and others asking for information about model ordinances on a great variety of subjects. In the absence of any comprehensive publication on model ordinances, the Information Service is thrown back on those cities and other municipalities which have advised the Association of regulations proved to be satisfactory.

The Information Service would welcome receipt of copies from any health officer who has ordinances of merit which he would recommend for the consideration of other areas. Address the Executive Secretary, American Public Health Association, 50 West 50th Street, New York, N. Y.

UNIVERSITY OF MINNESOTA IN-SERVICE FELLOWSHIPS IN PUBLIC ADMINISTRATION

THE University of Minnesota offers a limited number of in-service fellowships in public administration for the academic year 1938-1939. These are available to promising young men and women now in the service of government in order that they may better equip themselves to fill positions involving administrative leadership and responsibility. It is also the aim to encourage governmental bodies to give recognition to these persons in making promotions to administrative posts.

Applicants must be citizens of the United States, not over 35 years of age, graduates of recognized universities and colleges, and must qualify for admission to the graduate school at the University of Minnesota. They must have had not less than three years of experience in public service, preferably

in a position involving some administrative responsibility. Each applicant for an in-service fellowship must be endorsed by his governmental employer. Credit earned in residence at the University during the training period may be applied toward advanced degrees. Applications are to be submitted not later than April 1, 1938, and appointments will be announced May 15 or as soon thereafter as possible. Requests for application blanks and for further information should be addressed to the Secretary of the Committee on Training for Public Health Administration, 13 University Library, University of Minnesota, Minneapolis, Minn.

TUBERCULOSIS RULING

GEORGE C. Ruhland, M.D., of Washington, D. C., Health Officer of the District of Columbia, has reported a test case of the right of the Health Department of the District of Columbia to prevent a man from spreading tuberculosis to his children and other persons in the community. The Police Court ruled that the tuberculous patient could take his choice of paying a fine or receiving treatment in a sanatorium. A summary of the case follows: The patient was 73 years old, a night watchman. He had a wife 30 years old and 4 children ranging from 8 months to 9 years of age. A private physician reported the man to have tuberculosis in July, 1936. He failed to keep appointments at the clinic, and refused admittance to visiting nurses. He refused to have his children examined. On January 13, 1938, the Police Court ruled that Solomon Bell violated the laws of the District of Columbia relating to the prevention of tuberculosis.

DR. COGSWELL HONORED

DR. W. F. Cogswell, Montana's State Health Officer for the past 25 years, was honored at a Silver Anniversary banquet given by members and employees of the State Board of Health on January 17, in Helena. More than 80 persons were present, and 50 messages of greeting and congratulation were received by Dr. Cogswell.

Dr. Cogswell was first named Secretary of the Montana State Board of Health in 1912. In that year he was also Secretary of the Montana Public Health Association. When the State Board of Entomology was created in 1913, he was named chairman, and it was largely through his efforts that, in 1923, the Rocky Mountain Tick Laboratory for the study of spotted fever was established in Hamilton, Mont., and, in 1931, transferred to the U. S. Public Health Service.

In 1920, he was president of the State and Provincial Health Officers of North America, and in 1936, he was president of the Western Branch of the American Public Health Association.

Among the many letters received were those from Dr. Thomas Parran, Surgeon-General, and Dr. A. T. McCormack, President of the A.P.H.A. Another letter was from Joseph Brown, chairman of the Blackfeet Tribal Council, extending greetings to their "Chief Little Bull," Dr. Cogswell's tribal name.

VENEREAL DISEASE COURSE

A ONE-WEEK refresher course in venereal disease control is being offered at Western Reserve University, Cleveland, Ohio, open to any regularly licensed physician in Ohio, without fees.

This is a shortening of the graduate course recently announced as planned to cover 3 or 4 months. The short

course will consist of formal lectures on the several venereal diseases and demonstrations of methods of examination and treatment.

Further information and a copy of the working schedule may be obtained from George W. Binkley, M.D., 2085 Adelbert Road, S.E., Cleveland.

CANADIAN PUBLIC HEALTH ASSOCIATION MEETING

THE next annual meeting of the Canadian Public Health Association will be held in Halifax, N. S., from June 20-22, 1938.

The Lord Nelson Hotel will be the convention headquarters.

TRANSACTIONS OF THE CONGRESS ON HYGIENE

THE State Health Department of Maryland has a limited number of the Transactions of the Fifteenth International Congress on Hygiene and Demography meeting in 1912, which it will be glad to distribute without cost to any physician, public health official, or library, desiring a set. The set consists of 6 volumes dealing with the following subjects.

Volume I, Part I.—Organization and Membership. Part II.—Proceedings of the Joint Sessions and General Index. *Volume II*, Part I.—Hygienic Microbiology and Parasitology. Part II.—Dietetic Hygiene; Hygienic Physiology. *Volume III*, Part I.—Hygiene of Infancy and Childhood; School Hygiene. Part II.—Hygiene of Occupations. *Volume IV*, Part I.—Control of Infectious Diseases. Part II.—State and Municipal Hygiene. *Volume V*, Part I.—Hygiene of Traffic and Transportation. Part II.—Military, Naval, and Tropical Hygiene. *Volume VI*.—Demography.

Applications should be sent to Dr. Robert H. Riley, Director, State of Maryland Department of Health, 2411 North Charles Street, Baltimore, Md. The sets will be sent with express charges collect.

CANADIAN PUBLIC HEALTH ASSOCIATION ADOPTS STANDARD METHODS

ON the recommendation of the Section, the Canadian Public Health Association has adopted officially the Standard Methods for the Examination of Water and Sewage, as prepared by the American Public Health Association and the American Water Works Association, subject to the incorporation of such alternative methods as may be deemed necessary.—The Sixth Annual Christmas Meeting of the Laboratory Section of the Canadian Public Health Association, 1938. *Canad. Pub. Health J.*, Jan., 1938.

REGIONAL LABORATORIES

UNDER the provisions of the Bankhead-Jones Act, three new regional laboratories for the investigation of regional problems in agriculture were approved during the fiscal year ended June 30, 1937. The new regional laboratories include one for the study of animal parasites in the southeast, one for the development of swine breeding in the north central states, and one for sheep improvement in the range states.

The laboratory for the study of diseases and parasites of domestic animals is being established at the Alabama Polytechnic Institute, at Auburn. The experiment stations of 13 southeastern states are coöperating with the U. S. Department of Agriculture in the development of the program for regional studies, which will be under way in all the states with headquarters and coordinating direction at Auburn. The states are: Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee, Kentucky, and Oklahoma.

Regional research has been made possible by appropriations under the

Bankhead-Jones Act, which, unlike previous legislation for the support of experiment stations, require state appropriations to offset the federal contributions. Each state complied with this requirement and, on the average, state appropriations were several times the amount required under this provision.—*J. Am. Vet. Med. Assoc.*, Feb., 1938.

NORTH CAROLINA SYPHILIS CAMPAIGN

ACCORDING to the *Journal of the American Medical Association*, the Zachary Smith Reynolds Foundation is devoting the entire income from its funds, amounting to \$7,000,000, to finance a campaign against syphilis in North Carolina. The income is stated to be more than \$100,000 a year, and this amount has already been presented to the State Board of Health for the first year's work.

The State is now operating 67 clinics for venereal disease and the new fund will be used to expand about 12 of these in the more populous counties. For rural districts a clinic on wheels, consisting of a motor truck fitted as a physician's office and accompanied by a doctor and a nurse, will be developed as one of the first projects.

The plans are under the direction of Carl V. Reynolds, M.D.,† of Raleigh, the State Health Officer.

MARYLAND SUMMER CAMPS

OWNERS and operators of summer camps in Maryland—tourist, recreational, and labor—have been notified by R. H. Riley, M.D.,* Director of the State Department of Health, that all camps in Maryland must be inspected and duly licensed before they may be opened for visitors. Permits do not hold over from year to year. Whether the camps are old or new, permits must be secured for the coming season. No camp may be operated without one.

* Fellow A.P.H.A.

† Member A.P.H.A.

The regulations apply to every camp or picnic ground that is used for a period of 6 days or longer.

PARENTS' MAGAZINE AWARDS

SURGEON General Thomas Par-
ran's crusade against venereal
disease and Irene Wicker's 8 years of
broadcasting as *The Singing Lady* re-
ceive this year's awards for outstand-
ing service to children given by *The
Parents' Magazine*. The announce-
ment is made in the March issue of the
magazine.

In previous years only one award
was made. Other winners were: Walt
Disney, 1934; Grace Abbott, 1935;
Walter Damrosch, 1936; Dr. Allan
Roy Dafoe, 1937.

NURSES' BIENNIAL CONVENTION

THE Biennial Convention of the 3
national nursing organizations—the
American Nurses' Association, the
National League of Nursing Educa-
tion, and the National Organization for
Public Health Nursing—will be held
in Kansas City, Mo., April 24–29. The
Hotel President will be the convention
headquarters.

The central theme of the Biennial
will be "The Individual Nurse's Re-
sponsibility for Professional Progress."

NEW YORK HEALTH DEPARTMENT NURSING IN 1937

MEMBERS of the New York City
Health Department Nursing staff
made over 600,000 visits in 1937, ac-
cording to the February issue of *Our
Nurses*, issued February 5.

Of the total 600,000 visits, about
100,000 were made to infants and pre-
school children, 280,000 to homes of
school children, 110,000 to homes of
tuberculous patients, and 6,000 to
cases of acute contagion.

PERSONALS

Central States

DR. LOUIS P. H. BAHRENBURG, Direc-
tor of the U. S. Marine Hospital of
the U. S. Public Health Service, at
Cleveland, Ohio, has retired. He is
succeeded by **DR. FRANK M. FAGET**,
Senior Surgeon in the Service, who
has been at the Marine Hospital in
Louisville, Ky.

DANIEL C. BARRETT, M.D., C.P.H.,†
has become Director of the Wash-
ington County Health Unit, Iowa.
Dr. Barrett was formerly District
Physician for the Cincinnati, Ohio,
Health Department.

FRANCIS B. CARROLL, M.D., C.P.H.,†
of Paw Paw, Mich., has resigned as
Director of the Van Buren County
Health Department to join the
Division of Communicable Diseases
of the Massachusetts Department of
Health, Boston, Mass.

DR. FRED A. DENNIS, of Crawfords-
ville, Ind., has been appointed
Health Officer of Montgomery
County, succeeding **DR. JAMES S.
NOBLITT**, of Waveland.

DR. JOHN C. GLACKMAN, of Rockport,
Ind., has been appointed Health
Officer of Spencer County.

ALFRED G. LONG, M.D., C.P.H.,* of
Kokomo, Ind., has been appointed
Health Officer of the City of Miami
Beach, Fla.

MRS. BLANCHE R. MILLER, of Cincin-
nati, Ohio, has been appointed Super-
visor of Health Education of Cincin-
nati, a newly created position. Mrs.
Miller will develop a program of
health education in the schools and
the community in the campaign
against tuberculosis.

JOSEPH G. MOLNER, M.D., C.P.H.,†
and **FRANKLIN H. TOP, M.D.,
C.P.H.,†** both of Detroit, will divide
the responsibilities of the position

* Fellow A.P.H.A.

† Member A.P.H.A.

of Deputy Health Commissioner of Detroit, Mich., succeeding DON W. GUDAKUNST, M.D.,* who recently resigned to become State Health Commissioner.

DR. IRA E. PERRY, of North Manchester, Ind., has been appointed Health Officer of Wabash County, succeeding DR. ARTHUR J. STEFFEN, of Wabash.

DR. CARL M. PORTER, of Jasonville, Ind., has been appointed Health Officer of Greene County, Ind.

DR. CHARLES L. WISE, of Camden, Ind., has been appointed Health Officer of Carroll County, succeeding DR. ALBERT C. CLAUSER, of Delphi.

Eastern States

I. HOPE ALEXANDER, M.D.,† has been reappointed Director of Health of Pittsburgh, Pa.

FRANK A. CALDERONE, M.D., C.P.H.,† of Jericho Turnpike, Westbury, N. Y., is leaving the service of the State of New York and entering that of the City as District Health Officer of the Lower East Side Health Office, at 73 Cannon Street, New York, N. Y.

DR. ARTHUR J. COUTURE, of Moosup, Conn., has been appointed Health Officer of Sterling, for 4 years.

H. JACKSON DAVIS, M.D., DR.P.H.,* Assistant Director of Local Health Administration, New York State Department of Health, Albany N. Y., has become Chief Medical Officer on the staff of the State Department of Social Welfare. In addition to regular and special assignments in the department, Dr. Davis was Director of Medical Care for TERA until June 30, 1937; during the preceding 5 years he was responsible for the distribution of more than \$10,000,000 in medical relief in the state. He has also been responsible

for administrating details of 44 TERA "work relief projects" employing needy physicians, dentists, nurses, and other public health personnel. In addition to his assignment as TERA Director of Medical Care, Dr. Davis served as WPA Consultant on Medical Care for upstate New York soon after it was organized in 1935.

ROBERT D. JOHNSON, M.D., has been appointed Director of the Bureau of Tuberculosis in the Department of Health of Syracuse, N. Y., succeeding HENRY BURTON DOUST, M.D.

DR. CHARLES A. KRAUS, Professor of Chemistry and director of chemical research at Brown University, Providence, R. I., has been elected President of the American Chemical Society for 1939. DEAN FRANK C. WHITMORE, of Pennsylvania State College, State College, Pa., is President for 1938.

DR. JAMES H. LADE, who recently completed a fellowship in syphilis at Johns Hopkins Hospital, has been appointed Medical Consultant in the Division of Syphilis Control, New York State Department of Health.

DR. GEORGE S. LAMBERT has been appointed Health Officer in the Borough of Danielson, and Acting Health Officer of Killingly, Conn.

GOODHUE LIVINGSTON, JR., of New York, N. Y., has been sworn in as Secretary of the New York City Health Department.

GREGORY D. MAHAR, M.D.,† Commissioner of Health of Syracuse, N. Y., has returned at his own request to his former position as Senior Epidemiologist in the Syracuse Health Department.

ELEANOR W. MUMFORD, R.N., formerly Assistant Director of the National Organization for Public Health Nursing, has been appointed Associate for Nursing Activities by

* Fellow A.P.H.A.

† Member A.P.H.A.

the National Society for the Prevention of Blindness, succeeding FRANCIA BAIRD CROCKER, R.N.

MAURICE G. POSTLEY,[†] formerly Secretary of the New York City Health Department, has been appointed Secretary of the New York City Board of Education.

Southern States

DR. JAMES H. BUNN, JR., formerly of Henderson, has been appointed head of a new health unit in Johnston County, with headquarters in Smithfield, N. C.

DR. CHARLES F. ENGELKING has been reappointed Health Commissioner of Dalton and Whitfield County, Ga.

W. S. LEATHERS, M.D.,* Dean of the School of Medicine, Vanderbilt University, Nashville, Tenn., received the Doctorate of Humane Letters from Tulane University, New Orleans, La., on the occasion of the installation of DR. RUFUS C. HARRIS as President. The same degree was awarded REV. ALPHONSE M. SCHWITALLA, Ph.D., S.J.,[†] Dean of the School of Medicine, St. Louis University, St. Louis, Mo.

DR. FRANCIS F. SCHWENTKER resigned as Director of Medical Research in the Baltimore City Health Department January 1, to study scarlet fever in Rumania under the auspices of the Rockefeller Foundation.

DR. LOREN WALLIN, formerly of Sparta, Ga., has been appointed Health Officer of Anson County, N. C., a new health unit.

Western States

DR. PAUL R. ENSIGN, formerly of Butte, Mont., has been appointed Pediatrician to a child health demonstration in Hancock-Glascock Counties, Ga.

SAMUEL WEISSROSS, M.D.,[†] of Boise, Assistant Director of Public Health, of the Idaho State Department of Public Welfare, has taken charge of

industrial hygiene activities and of medical statistics.

Canada

ADELARD GROULX, M.D., C.P.H., of Montreal, Quebec, has been appointed Director of the Department of Health of the City of Montreal, succeeding SERAPHIN BOUCHER, M.D.,* retired.

DEATHS

GEORGE HENRY FALKINER NUTTALL, M.D., F.R.S., died suddenly in England, at the age of 75. He was born in San Francisco. He received his medical training in the University of California, Johns Hopkins, and Göttingen. He was assistant to Dr. William H. Welch at Johns Hopkins University in 1890, and later became Associate in Hygiene. He taught bacteriology and preventive medicine in Cambridge, and in 1895 became Reader in Hygiene. He was appointed Quick Professor of Biology, and was elected a professorial Fellow of Magdalene College. His researches are incorporated in more than 200 unpublished papers, and cover bacteriology, serology, hygiene, tropical medicine, and parasitology. His most important discovery was the bactericidal property of the blood serum and other body fluids, which is credited as the pioneer work in immunology.

ETHEL M. HANSON, for 20 years Director of the Health and Parent Education Association of Cleveland, Ohio, died recently.

W. F. ROBERTS,[†] Minister of Health and Labor for New Brunswick and the first Minister of Health in the British Empire, died at Saint John, N. B., February 10, at the age of 68.

JOHN N. RYAN, M.D.,[†] Health Officer of Passaic, N. J., for 26 years, died February 10.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

- American Academy of Tuberculosis Physicians. San Francisco, Calif. June 13-14.
- American Association of Medical Social Workers. Seattle, Wash. June 26-July 2.
- American Association of Pathologists and Bacteriologists. Atlantic City, N. J. May 3-4.
- American Association of Psychiatric Social Workers. Seattle, Wash. June 26-July 2.
- American Association of Schools of Social Work—Joint Meeting with American Association of Social Workers, and National Conference of Social Workers. Seattle, Wash. June 26-July 2.
- American Association of Social Workers—Joint Meeting with American Association of Schools of Social Work, and National Conference of Social Workers. Seattle, Wash. June 26-July 2.
- American Chemical Society. Dallas, Tex. April 18-21.
- American College of Physicians, Waldorf-Astoria Hotel, New York, N. Y. April 4-8.
- American Dental Association. St. Louis, Mo. October.
- American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9-14.
- American Home Economics Association—31st Annual Meeting. William Penn Hotel, Pittsburgh, Pa. June 28-July 1.
- American Hospital Association. Dallas, Tex. September 26-30.
- American Institute of Nutrition: Johns Hopkins University—School of Hygiene and Public Health. Southern Hotel, Baltimore, Md. March 30.
- American Medical Association. San Francisco, Calif., June 13-17.
- American Nurses Association. Hotel President, Kansas City, Mo. April 24-29.
- American Public Health Association — 67th Annual Meeting. Hotel Muehlebach, Kansas City, Mo. October 25-28.
- American Public Welfare Association—Joint Meeting with National Conference of Social Workers. Seattle, Wash. June 26-July 2.
- American Society of Clinical Pathologists. San Francisco, Calif. June 9-11.
- American Veterinary Medical Association. New York, N. Y. July 5-9.
- American Water Works Association—Annual Meeting. Hotel Roosevelt, New Orleans, La. April 24-28.
- American Water Works Association: New York Section. Hotel Jamestown, Jamestown, N. Y. March 17-18.
- Kentucky Section. Brown Hotel, Louisville, Ky. March 21-23.
- Canadian Section. Prince Edward Hotel, Windsor, Ont. March 23-25.
- Illinois Section. Orlando Hotel, Decatur, Ill. April 5-6.
- Indiana Section. Purdue Union Building, West Lafayette, Ind. April 7-8.
- Montana Section. Baxter Hotel, Bozeman, Mont. May 13-14.
- Pacific-Northwest Section. Davenport Hotel, Spokane, Wash. May 19-21.
- Florida Section. Daytona Beach, Fla. May 23-25.
- New Jersey Section. Hackensack Water Company Plant, New Milford, N. J. May 25.

- Association for the Study of Allergy.
San Francisco, Calif. June 13-14.
- Association for the Study of Internal Secretions. San Francisco, Calif. June 13-14.
- Association of Foods and Drug Officials of South Central States. Biloxi, Miss. May.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13-15.
- Building Officials Conference of America. Washington, D. C. March 23-25.
- California Association of Health, Physical Education and Recreation. Pasadena, Calif. April 18-19.
- California Conference of Social Work. Pasadena, Calif. April 24-28.
- California Medical Association. Pasadena, Calif. May 9-12.
- Central Physical Education Association. Minneapolis, Minn. March 30-April 2.
- Conference of State and Provincial Health Authorities of North America. Washington, D. C. April 9-12.
- Congress of American Physicians and Surgeons. Atlantic City, N. J. May 2-6.
- Congress of Parent-Teachers Association. Battle Creek, Mich. April 20-22.
- Dairy Products Association of the Northwest. St. Paul, Minn. April.
- Federation of American Societies for Experimental Biology. Baltimore, Md. March 30-April 2.
- Georgia Public Health Association. Atlanta, Ga. May.
- Governmental Research Association. Princeton, N. J. September 7-10.
- Hawaii Territorial Medical Association. Honolulu, T. H. May.
- Health and Accident Underwriters Conference. Chicago, Ill. May 24-26.
- Hermann Michael Biggs Lecture—Annual. Subject, "Virus Diseases," Speaker, Thomas M. Rivers, M.D.
- New York Academy of Medicine, New York, N. Y. April 8 (8:30 P.M.).
- International Association for Dental Research. Minneapolis, Minn. May 12-13.
- Iowa Public Health Association. Des Moines, Ia. May.
- Iowa Tuberculosis Association. Ottumwa, Ia. March.
- Manufacturing Chemists Association of the United States. Sky Top, Pa. June 2-3.
- Medical Library Association. Hotel Somerset, Boston, Mass. June 28-30.
- Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13-15.
- Michigan Public Health Association. Lansing, Mich. November 2-5.
- Mississippi Valley Conference on Tuberculosis. St. Louis, Mo. October 1-3.
- Missouri Public Health Association. Jefferson City, Mo. April.
- National Biennial Nursing Convention. Hotel President, Kansas City, Mo. April 24-29.
- National Conference of Social Workers—Joint Meeting with American Association of Schools of Social Work, and American Association of Schools of Social Work. Seattle, Wash. June 26-July 2.
- National Conference on Weights and Measures. Washington, D. C. June.
- National County Officers Association. Rock Island, Ill. May.
- National Dairy Association. Columbus, Ohio. October 8-15.
- National Education Association. New York, N. Y. June 26-30.
- National Hospital Association (Negro). Hampton, Va. August 14-16.
- National League of Nursing Education. Hotel President, Kansas City, Mo. April 24-29.

National Negro Health Week. March 27-April 2.

National Organization for Public Health Nursing. Hotel President, Kansas City, Mo. April 24-29.

National Probation Association. Seattle, Wash. June 24-28.

National Tuberculosis Association. Biltmore Hotel, Los Angeles, Calif. June 20-23.

New England Hospital Association. Boston, Mass. March 10-12.

New England Sewage Works Association. (Joint meeting with New York State Sewage Works Assn.) Hotel Bond, Hartford, Conn. October 6-8.

New Mexico Public Health Association. Albuquerque, N. M. June.

New York Heart Association—Scientific Session. New York Academy of Medicine, New York, N. Y. March 29.

New York State Sewage Works Association—Spring Meeting. Buffalo, N. Y. June 3-4.

Ohio Federation of Public Health Officials. Deshler Hotel, Columbus, Ohio. April 29.

Pennsylvania Public Health Association. Harrisburg, Pa. May.

Polish Medical and Dental Association of America. Pittsburgh, Pa. August.

Public Health Association of New York City. New York. March 9.

Smoke Prevention Association. Nashville, Tenn. May 24-27.

Social Work Publicity Council. Seattle, Wash. June 26-July 2.

South Carolina Public Health Association. Myrtle Beach, S. C. May 23-25.

Southern Medical Association. Oklahoma City, Okla. November.

State and Provincial Health Authorities of North America—Annual Meeting. Washington, D. C. April 9-12.

State and Territorial Health Officers Conference with the Surgeon General. Washington, D. C. April 9-12.

Texas Public Health Association. San Antonio, Tex. November 7-9.

Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2-9, 1939.

Western Branch, American Public Health Association. Hotel Multnomah, Portland, Ore. June 6-8.

FOREIGN

American Water Works Association—Canadian Section. Prince Edward Hotel, Windsor, Ont., Canada. March 23-25.

International Congress on Rheumatism and Hydrology—convened by the International Society of Medical Hydrology and the International League Against Rheumatism. Oxford, England. March 25-31.

Bath Congress on Chronic Rheumatism, to commemorate the bicentenary of the Bath Royal National Hospital for Rheumatic Diseases. Oxford, England. March 31-April 3.

Industrial Accident Prevention Associations, Inc. Windsor, Ont., Canada. April 28-29.

International Congress of Obstetrics and Gynecology. Amsterdam, The Netherlands. May 4-8.

International Association of Public Employment Services. Ottawa, Ont., Canada. May 26-28.

Ontario Health Officers' Association. Chateau Laurier, Ottawa, Ont., Canada. June 17-19.

Canadian Public Health Association. Lord Nelson Hotel, Halifax, N. S., Canada. June 20-22.

Royal Sanitary Institute. Portsmouth, England. July 11-16.

Scientific Congress of Doctors and Dentists—"ARPA." Prague, Czechoslovakia. July 21-25.

International Medical Society for Psychotherapy—10th Annual Congress. Balliol College, Oxford. England. July 29-August 2.

American Journal of Public Health

and THE NATION'S HEALTH

Volume 28

April, 1938

Number 4

Certain Criteria in the Qualifications and Preparation of Health Officers*

HENRY E. MELENEY, M.D.

*Department of Preventive Medicine and Public Health, Vanderbilt
University School of Medicine, Nashville, Tenn.*

THE United States is faced with certain special problems in the selection of qualified health officers. The country contains regions so different in geographical conditions, resources, interests, and types and concentration of population, that its public health problems are diversified. The autonomy of our state and local governments in matters of health makes it difficult to obtain the adoption of uniform standards for the selection of health officers. The traditional association of public office with political preferment rather than with qualifications for efficient service has hindered progress and discouraged many persons of high caliber from entering governmental employment.

There are certain advantages in the autonomy of state and local govern-

ments which may counteract the benefits of the uniformity created by centralized federal control. Local responsibility, when it is assumed by skillful, conscientious leadership, encourages initiative and tends to develop higher standards than can usually be attained under remote governmental control; but where the people of a community are uninformed as to the qualifications necessary for efficient service, or where appointments of professional personnel remain on a political basis, autonomy is a liability rather than an asset.

Much progress has been made in the past few years in stabilizing the profession of public health and in crystallizing opinion concerning the qualifications of those who are to enter the profession. Educational facilities have been extended and improved and opportunities have been provided for an increasing number of individuals to take advantage of these facilities.

* Read at a Special Session of the Committee on Professional Education of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

EDUCATIONAL STATUS

In order to obtain some estimate of the present educational status of the health officers of the country I have made a summary of the professional degrees and certificates held by state and insular health officers, by whole-time county and district health officers, and by the whole-time and part-time health officers of cities of 10,000 or more population, as reported for 1936 by the United States Public Health Service.^{1, 2, 3} While the mere possession or lack of a professional degree cannot be taken as a measure of the efficiency of a health officer, it does give some indication of his accredited educational equipment.

The analysis of the degrees and certificates held by state and insular health officers is shown in Table I. All of these health officers hold a medical degree and 12 of the 55, or 22 per cent, hold an additional public health degree. It is obvious from this analysis that the states recognize the importance of a medical education as a qualification for the directors of their central health organizations. Many of the state health officers who do not hold an additional public health degree have had long experience in public health and are among our ablest leaders in this field. These men have so firmly established themselves by their accomplishments that political influences usually cannot remove them from office. Many states require the appointment of highly qualified state health officers, and in some cases nominations for the position are made by nonpartisan boards, thus insuring the selection of qualified individuals. It is to be hoped that in the near future legislation and custom will remove the appointment of all state health officers from political control. These positions are the key-stones in the American system of local health administration, and the future success of this system depends largely

upon the stabilization of state health officials on a high plane of efficiency.

TABLE I

Number and Percentage of State and Insular Health Officers Holding Various Degrees, 1936

<i>Degree</i>	<i>Number</i>	<i>Per cent</i>
M.D.	43	78.2
M.D. + C.P.H.	6	10.9
M.D. + D.P.H.	1	1.8
M.D. + Dr.P.H.	5	9.1
Total	55	100.0

The analysis of the degrees and certificates held by whole-time county and district health officers (Table II) shows that, of the 574 officers listed, 87.5 per cent hold a medical degree alone, and 12 per cent hold a public health degree in addition to a medical degree. Only 3 full-time county health officers lack a medical degree, 1 of whom holds a bachelor of science degree in public health, 1 a master of science degree alone, and 1 no degree. It is probable that a majority of the full-time county health officers holding medical degrees alone have received some kind of postgraduate instruction in public health, and under the present arrangements sponsored by the U. S. Public Health Service most of the others who can benefit by such instruction will undoubtedly receive it in the near future.

TABLE II

Number and Percentage of Whole-time County Health Officers Holding Various Degrees, 1936

<i>Degree</i>	<i>Number</i>	<i>Per cent</i>
M.D.	502	87.5
M.D. + Public Health	69	12.0
B.S. or M.S.	2	0.3
No degree	1	0.2
Total	574	100.0

The analysis of degrees and certificates held by city health officers is

shown in Table III. It is divided into cities having a population of 50,000 or more, and those having a population of 10,000 to 50,000. Among 191 cities of 50,000 or more population the analysis shows that 69 per cent have whole-time health officers, 31 per cent have part-time. Among the 131 whole-time health officers 74 per cent hold a medical degree without a graduate degree in public health, 13 per cent a medical and a public health degree, 2 per cent a public health or sanitary engineering degree without a medical degree, 2 per cent a veterinary or pharmacist degree, and 8 per cent no degree. Among the 60 part-time health officers, all hold medical degrees and 1 an additional public health degree.

nurses or public health nurses; and 38 per cent hold no degree. Among the 433 part-time health officers, 90 per cent hold a medical degree, 4 of which are supplemented by public health degrees, 2 per cent hold other degrees, and 8 per cent hold no degree.

A further statement is necessary concerning the status of city health officers who hold no degree. Among the cities of 50,000 or more population there are 11 in which the person designated as health officer holds no degree. Eight of these have the official title of health officer or its equivalent. The other 3 have the official title of clerk, agent, or executive officer of the board of health. Among the smaller cities there are 146 in which the person

TABLE III
Percentage of City Health Officers Holding Various Degrees, 1936

	<i>Cities of 50,000 and Over Population</i>		<i>Cities of 10,000 to 50,000 Population</i>	
	<i>Whole-time</i>	<i>Part-time</i>	<i>Whole-time</i>	<i>Part-time</i>
Number of health officers	131	60	290	433
Per cent whole-time or part-time	68.6	31.4	40.1	59.9
Degree				
M.D.	74.0	98.4	44.1	89.0
M.D. + Public Health	13.0	1.6	11.0	0.9
Public Health or Engineering	2.3	0.0	1.7	0.2
Other Degrees	2.3	0.0	3.1	1.4
Regist. Nurse or Public Health Nurse	0.0	0.0	2.1	0.2
No Degree	8.4	0.0	37.9	8.3
Total	100.0	100.0	99.9	100.0

The analysis for 723 cities having a population of 10,000 to 50,000 shows that only 40 per cent of these cities have whole-time health officers while 60 per cent have part-time. Among the 290 whole-time health officers 44 per cent hold a medical degree alone; 11 per cent a medical degree and a public health degree; 2 per cent only a degree in public health or sanitary engineering; 3 per cent a veterinary, optometrist, pharmacist, or other graduate degree; 2 per cent are registered

designated as health officer holds no degree. Of these, 75 per cent have the official title of health officer or its equivalent, the others have various titles, such as clerk, agent, sanitary inspector, or chief of police. Thus the large majority of these officials are considered health officers, and although a few of them may hold an academic degree which is not mentioned in the report, it is probable that most of them do not possess the professional qualifications necessary for an efficient

health officer. Seventy-seven per cent of the health officers possessing no degree are in 3 northeastern states. This indicates that there must be special circumstances in these states responsible for the selection or designation of non-professional persons as health officers. In one a bill requiring the appointment of highly qualified city health officers has been defeated in the legislature every year for a number of years; in 1 there is a licensing law for health officers which does not require adequate academic qualifications; and in 1 the state health department is handicapped by political influences. It would seem advantageous for every state to possess a statute requiring professional qualifications of city health officers as well as of all other public health personnel within its jurisdiction.

In communities having poorly qualified official public health personnel, it is probable that much of the public health program is carried on in an uncoördinated manner by voluntary organizations, sometimes in the face of opposition from the entrenched and inadequate official agency. It is reasonable to ask whether such communities are not deluded by a false sense of security with regard to the health of their people, whether they really know the amount of preventable disease in their midst, and whether they are not wasting both tax money and voluntary contributions by failure to unify the work under full-time qualified personnel.

Most cities of 50,000 or more should be able to meet the financial requirements for employing a well qualified full-time health officer, but in smaller cities this is often impossible. The difficulty, however, can be solved by combining the full-time health service of such cities with that of neighboring towns or the surrounding rural area. This arrangement, which has already proved successful in a number of

localities throughout the country, offers the additional advantages of unifying effort in communities having common interests and of creating a spirit of coöperation where unpleasant rivalry might otherwise exist.

BASIC QUALIFICATIONS

The necessary qualifications of an efficient health officer may be divided into personal, preliminary educational, and professional. The most important personal qualifications are integrity, leadership, and administrative ability. These are assets which should be possessed by any person who is to occupy an influential administrative position in a community.

The preliminary educational qualifications of an efficient health officer are those required of anyone who is to meet all classes of people in the community on an equal footing. The broader this educational background is the better prepared the health officer will be to deal wisely with the complex problems involved in the health of the community. Many human ills lie largely outside the realm of technical procedures and require a broad outlook for their correction. The most recent trend in college education is toward the preparation of students for intelligent citizenship, with a background of history, language, the sciences and the arts, and such a background the health officer should have.

Professional qualifications must, of course, be developed on the foundation of general education, continuing certain subjects which were started in the preliminary educational period and adding the more technical subjects which enter into public health practice. This is the function of schools of medicine and public health.

The two most important fields of study in the educational equipment of the health officer are the biological sciences and social sciences. In the

social sciences he should have adequate preparation in psychology, sociology, economics, and government. Elementary instruction in these subjects should be received in the preliminary educational period, and this should be followed up in the period of professional study by courses on the special phases of these subjects which are related to public health.

In psychology the health officer must deal with the normal and abnormal reactions of individuals, organizations, and communities, and he must be able to influence them into action. In sociology he must understand heredity, racial problems, population trends, urban and rural relationships, and crime. In economics he must be able to get the most out of his limited budget and he must understand the financial problems of the industrial or agricultural groups of his community. In government he must understand the philosophy and machinery of national, state, and local government, must protect his program against political manipulation, and must know his legal rights and limitations.

An adequate background in the biological sciences is, however, the essential element in the educational equipment of the health officer. Certainly no one can approach health problems intelligently without an appreciation of human and environmental biology. Elementary instruction can be obtained in the introductory courses in general biology offered in colleges, which include the fundamentals of botany, zoology, evolution, and heredity. This is logically followed by a course in vertebrate anatomy and embryology such as is required of premedical students. These courses are merely a foundation for the study of human biology and should be followed by courses in the basic medical sciences, namely, human anatomy, biochemistry, physiology, pathology, and bacteriology. These

provide a familiarity with the normal and pathological conditions of the human body, and its reactions to environment and invading microorganisms. Such a biological background has been considered by some to be adequate for a health officer, but if he is to be fully equipped for his work he should also be familiar with the fundamentals of clinical medicine, surgery, pediatrics, obstetrics, and psychiatry, all of which are intimately related to public health.

THE MEDICAL DEGREE

A word may be said concerning the requirement that all health officers should possess a medical degree. Obviously, the mere possession of such a degree without administrative ability, personal qualifications, and a knowledge of the principles of public health does not qualify a person to be a health officer. Too often in the past poorly qualified physicians have been appointed because of personal or political friendships, and it is these appointments which have occasioned criticism. Such physicians, however, have failed in spite of a medical degree rather than because of it. Graduates in medicine certainly possess administrative and personal qualifications comparable to those of other educational groups, and because the medical degree places the health officer in a position of equality and professional intimacy with the physicians of his community, there is every reason for taking advantage of the increasing supply of young men possessing a modern medical background. This advantage is all the greater in view of the fact that preventive medicine and public health are becoming major subjects in the undergraduate medical curriculum.

This reference to the advantages of utilizing medical graduates as health officers should not be interpreted as excluding from consideration well quali-

fied persons who do not possess a medical degree. By this I mean persons who have completed the basic medical sciences followed by 2 years of academic instruction in public health and a period of field experience. One so equipped may become an able administrator in public health, but it should be recognized that his field of activity may be limited to communities in which he can employ graduates in medicine to supervise the medical activities of his department. In view of such possible limitations it is advisable to recommend that all persons looking forward to a career as a public health officer should obtain a medical degree prior to postgraduate instruction in public health.

POSTGRADUATE INSTRUCTION IN PUBLIC HEALTH

Whether or not a candidate possesses a medical degree, he must supplement his general background by the technical training furnished by a postgraduate course in public health if he is to become fully qualified. The subjects usually required in schools of public health are biostatistics, epidemiology, public health administration, public health bacteriology, sanitation of water, sewage and foods, communicable diseases and nutrition. In addition, instruction should be given in mental hygiene, health education, governmental organization, and social work. Subsequent to intramural instruction there should be practical field instruction in a well organized health department under adequate supervision.

It would be ideal if all states and local communities could now require a full year of postgraduate study as a qualification for health officers. It should be required by all states at least for the professional personnel of their central organizations. For small cities and rural areas, however, a reasonably efficient full-time public health service

may be developed by the employment of medical graduates who have received shorter postgraduate instruction. Such short courses may take the form of orientation in all the important phases of public health work, or they may cover the work of one term in a course leading to a certificate or master's degree in public health. The orientation type of course is also valuable for physicians who have acted as health officers for a number of years without previous academic instruction in public health, but who are too old to be admitted to courses covering a full academic year. Younger men who take such an orientation course should be given the benefit of a full year of postgraduate instruction at a later time if their record of service warrants it.

NEEDS AND OUTLOOK FOR THE FUTURE

The present educational needs for the professional preparation of health officers in this country include both an improvement and expansion of the facilities for extended postgraduate study and a continuation and strengthening of short courses of instruction. As the immediate demand for full-time health service becomes satisfied, the shorter periods of instruction will be replaced by courses of adequate length, and every effort should be made to hasten this development.

Meanwhile, replacement of non-professional health officers should be encouraged, minimum standards should be raised, and information should be given to communities which will assist them in improving and stabilizing their public health personnel. States can encourage their local communities along these lines by enacting legislation requiring the appointment of qualified personnel, by educating local governing bodies, and by subsidizing full-time local health service.

Legal requirements for the selection of health officers, such as age, residence,

civil service, professional degrees, and practical experience, as well as procedure in making appointments, are matters determined by statute and will always differ to a certain extent in various states and communities. They are pertinent to this discussion only in so far as they set limitations which will affect the selection of persons having the best qualifications.

As long as states and local communities retain a relative degree of autonomy they will set their own standards and select their own health officials. A few will probably retain archaic requirements of residence or even political affiliation, and will thus automatically limit the possibility of securing the best service. Others will develop a career service based upon the best obtainable personnel, and will provide their appointees with opportunities for security, advancement, adequate remuneration, and further education, which will bring rewards to the people in the form of better health.

Standardization will limit progress and should be avoided, but an agreement should be reached as to the basic principle that every community should be provided with an adequate full-time health service, under the direction of a highly qualified health officer who is free from political domination. On such a foundation professional standards can constantly be raised to meet the increasing demands for more efficient service. The United States contains a wealth of material for this movement, which only asks that the door of opportunity be opened and a successful future promised in order to produce results which will assure continuous improvement in our national health.

REFERENCES

1. Directory of State and Insular Officers, 1936. *Pub. Health Rep.*, 51:1460-1478 (Oct. 23), 1936.
2. Directory of Whole-time County Health Officers, 1936. *Pub. Health Rep.*, 51:1160-1170 (Aug. 21), 1936.
3. City Health Officers, 1936. *Pub. Health Rep.*, 51:1575-1592 (Nov. 13), 1936.

Rural Health Services

“THE survey of rural health services in the United States for the calendar year 1936 showed that there was a net gain of 331 in the number of counties under full-time health administration over the number reported for the previous year. The total number is now in the neighborhood of 1,000. There are now 6 states in which all counties are served by full-time county or district health units, as compared with 3 so organized at the close of the calendar year 1935. The percentage of the total rural population now enjoying this service is estimated at 41.7 per cent. It has been interest-

ing to note in a number of states a trend toward utilization of the district plan to a greater extent in the organization of local health service. In spite of these highly encouraging facts, however, there are still 10 states which do not have any local health service corresponding to the generally accepted standards implied by this term.”—From “A Brief Review of Progress in the Public Health Program under Title VI of the Social Security Act.” C. E. Waller, Assistant Surgeon General. U. S. Public Health Service—*The Health Officer*, February 1938.

The Physician's Statement of Cause of Death*

A. HARDISTY SELLERS, M.D., D.P.H.

*Department of Health for Ontario, and School of Hygiene,
University of Toronto, Toronto, Ont.*

THE physician's statement of cause of death is an important scientific document. It provides information respecting past medical and public health experience, and signposts to problems affecting the health and longevity of our people now and in the future. Accurate mortality records are of great sanitary importance, and progress in medicine and public health has been substantially furthered by them. In the future, too, further guidance in public health will be expected from these records. It is therefore important that every effort be made to improve the reliability and accuracy of statements on the medical certificate in such a fashion that official data will likewise become more accurate and thus more valuable.

There are 3 aspects of medical certification to which we should give special thought: (1) the education of physicians and medical students in the principles and practice of death certification, (2) the form of the questions relating to cause of death, and (3) the statistical practices to which medical statements are subjected when the data are being tabulated.

EDUCATION OF THE MEDICAL PROFESSION IN DEATH CERTIFICATION

Every physician appreciates in a general way the importance of the collection, tabulation, and analysis of mortality statistics. It is doubtful, however, if many of them realize the importance of care and judgment in making their statements. It was with this in mind that the Commission revising the *International List of Causes of Death* in 1929 expressed the opinion that "it was of the utmost importance that medical practitioners and medical students be given special instructions as to the principles governing death certification." The achievement of accurate statements which reflect physicians' considered opinion, depends first upon physicians understanding clearly the significance of the questions relating to cause of death and the general principles upon which death certification is based. Official records can never be more accurate than the statements of medical practitioners, no matter what conventional treatment of them be employed. Education of the profession, particularly medical students, in the purpose and use of the medical certificate is therefore a first essential. A beginning in this respect has been made in Canada through the introduction of an exercise on medical certification as part of the instruction

* Read before the Vital Statistics Section of the American Public Health Association, at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

in 6 medical schools.¹ Undoubtedly this effort will aid substantially in improving medical certification in Canada in the future.

What does the physician need to know to enable him to complete a satisfactory medical certificate? He must first understand clearly what is meant by "cause of death" for statistical purposes. This is defined as "the disease or injury which initiated the train of events leading to death," and it is this entity of which a clear indication is desired. This definition is designed so that medical records may serve to direct attention to the point at which preventive measures may best be applied. Detailed statements are not desired, a single entry being preferable in all cases where this can be regarded as adequate. The physician's statement of cause of death is not intended to be an abstract of the clinical history and pathological findings. Detailed studies in any case can and should always be made on samples where greater reliability may be attached to such detail, as in hospitals. Death certificates should be expected to contain merely a clear, authoritative, scientific, and logical expression of medical opinion as to the cause of death. An entry of several morbid conditions or states has, of course, no particular disadvantage from the medical or statistical standpoint if they are presented in logical order and without ambiguity.

Given a clear understanding of what is meant by "cause of death" for statistical purposes, it is then necessary that physicians be well acquainted with the significance of the questions relating to cause of death, whatever form they may take, so that they may avoid the many common errors and not obscure their statements by incorrect entries.

"The writing of a satisfactory death record is often a matter of no small

difficulty," but "a considerable service can be rendered to the preventive medicine of the present and of the future by each physician, surgeon, and pathologist who endeavors to produce correct and complete mortality and notification records."² Time can surely be found to impress these things upon every medical student before graduation.

FORM OF THE QUESTIONS RELATING TO CAUSE OF DEATH

The medical certificate "should be so planned as to give the physician the opportunity of clearly expressing his opinion as to the cause of death in each individual case."³ At the same time, the order of statement needs to be such as to separate contributory causes which *are related* to the disease causing death (secondary or complicating conditions), and those which are considered contributory factors in causing death but entirely *independent* of the underlying condition responsible for the fatal outcome. Given such a method of orderly statement and the coöperation of the medical profession, it should be possible to eliminate almost entirely the use of arbitrary rules and also to dispense with a request for duration or date of onset which has little or no scientific accuracy in most cases when recorded anyway.

From the national viewpoint it matters not what form the medical questions take in another country, but in each country individually this question should be regarded as one of special importance. At present there are almost as many editions of the medical certificate as there are countries using the *International List*. This is undoubtedly an important factor in limiting international comparability of records apart entirely from variation in rules of choice for joint cause selection. Indeed, even were the latter uniform it would be impossible to expect much

in the way of reliable comparisons if certifying practice and the form of the medical certificate still varied. A signal achievement lies in the van of measures directed toward the adoption by all countries using the *International List*, of questions relating to cause of death which are either the same or essentially similar in character.

The existence of so many different types of questions in the medical statement of cause of death the world over bespeaks dissatisfaction with probably most of them. Dissatisfaction in Canada was general long before the study of the phraseology of the medical questions was initiated in 1933. In France, Germany, and Holland only "cause of death" is requested, and it is not intimated that more than one entry would ever be appropriate, nor is instruction given for the certifier's guidance in selection of that single cause. In Japan the certifier is specifically instructed to make only a single entry, but instructions for his guidance are given. There is no evidence, however, that the physician has intelligently applied his instructions and, furthermore, there is no possibility of tabulating more than one cause.⁴ In Canada until 1935, and in the United States until 1930, two questions were included, namely: "Cause of Death," and "Contributory (secondary) Cause." In England and Wales until 1927 the form called for

"Cause of Death" and "Secondary (Contributory) Cause."

In Sweden the form provides for principal and contributory causes, suggesting that in some cases it may be appropriate to indicate more than one cause, the interrelation being one of importance. The relationship most frequently called for in other countries is one of causation, but prior to the revision of the medical certificate in the years noted above in England and Wales, the United States and Canada, the forms called for statements of causal relationship and then obscured the issue by indicating that the statement might alternately be one of importance. Thus relationship of causation and importance were thoroughly confused.

When multiple causes are stated, two relationships between jointly stated causes of death, namely, of importance and of causation, are of interest to those tabulating returns. The medical certificate used in Switzerland (Figure III) illustrates this in making provision for (a) primitive disease or primary cause, (b) consecutive disease and immediate cause, and (c) contributory diseases or circumstances worthy of mention.

From the physician's point of view the form of the questions should be logical and convenient to his memory, and *from the statistician's viewpoint*

CAUSE OF DEATH	
<i>Principal Cause</i>	1.
Immediate Cause	due to
Causes antecedent to above in order of relationship	2.
	due to
	3.
	due to
<i>Independent contributory causes, if important (not causally related to principal cause)</i>	4.

FIGURE I

should clearly separate those causes which are related and those causes which are independent of the disease responsible for death and to which death should be attributed.

DEVELOPMENTS IN RECENT YEARS
The report of the committee entrusted with the Study of Causes of Death in its report to the Health Organization of the League of Nations in 1925, suggested the certificate reproduced in Figure I.⁴

Immediate principal cause was defined as the morbid condition actually causing death, and causes antecedent to it, any others of which it was the consequence. If multiple causes were recorded, the order of relationship would be indicated thus: (1) broncho-pneumonia, (2) measles; (1) acute peritonitis, (2) intestinal perforation, (3) typhoid fever. This form begins at the proximal end of the train of causation rather than at the "primary cause" and thus assures a statement of the cause required for tabulation.

The committee indicated that in most instances it would be sufficient to state the principal cause, "reserving statement of contributory causes for instances where the deceased succumbed to a combination of maladies none of which would necessarily have been fatal alone." In such cases the certifier's judgment alone can indicate

the cause which should be selected for tabulation.

The present difficulties and present statistical practices arise largely because the information for making an intelligent selection for tabulation is not obtained from the certifier. It is therefore necessary to substitute certain general rules which may or may not apply in any given case. This form, as can be readily seen, establishes both the relationship of importance and of causation, and provides an opportunity for the physician to set forth clearly his opinion. It would appear to make it possible to dispense almost entirely with rules of selection and ultimately to form simple rules, in each case based on the certifier's opinion as expressed in his statement.

It is noteworthy that in 1927 a medical certificate similar in outline to that suggested in the committee's report was introduced in England and Wales (Figure II). Following the introduction of this form, selection according to the usual plan was continued, but late in 1935 it was recommended that beginning in 1941 the selection of the causes of death for tabulation be based on the certifier's viewpoint as expressed on the certificate, in place of selection by rule.⁵ Thus it has been shown that the new form of statement is a satisfactory one and that this, the original objective, first despaired of,⁶

CAUSE OF DEATH	
I	
Immediate cause *	(a)
	due to
Morbid conditions, if any, giving rise to im-	(b)
mediate cause (stated in order proceeding	due to
backwards from immediate cause)	(c)
II	
Other morbid conditions (if important) con-	.....
tributing to death but not related to im-	.....
mediate cause.	
* This does not mean the mode of dying, such as, e.g. heart failure, assthenia, etc. It means the disease, injury or complication which caused death.	

FIGURE II—ENGLISH FORM

MEDICAL DECLARATION OF CAUSE OF DEATH—SWITZERLAND

- | | |
|--|-------|
| (a) Primitive disease or primary cause | ..... |
| (b) Consecutive disease and immediate cause of death | ..... |
| (c) Contributory diseases or circumstances worthy of mention | ..... |

FIGURE III

will be achieved within 15 years of the introduction of the new certificate. It would appear, therefore, that the recommendation of the Commission revising the *International List* in 1929³ is possible of achievement, namely: "that the certificate of death should be planned so as to show as exactly as possible the opinion expressed by the physician on the cause or causes of death in each individual case, and to limit as much as possible the selection by the Central Bureau entrusted with the classification of the cause of death."

As the certifier is given a free hand to trace the pathological history of his patient, some will push this matter much further than others. Some will be satisfied with recording cerebral hemorrhage as the cause of death; others will record arteriosclerosis as the cause of the hemorrhage; and still others may mention the septic or other cause to which they attribute the arteriosclerosis. The international adoption, in principle at least, of such a certificate as that proposed by the League of Nations Study Committee cannot, therefore, be expected to dispense completely with the need for agreement on certain points of detail. Such deaths are all essentially similar in nature and should be grouped to-

gether. It would not do to assign some of them to cerebral hemorrhage, others to arteriosclerosis, and others to the condition recorded as the cause of the arteriosclerosis. It would be necessary to agree upon the point at which such chains of causation should be severed for statistical purposes.

International agreement should be easier to attain in respect to such conventions than upon rules of selection such as we now have. Today, we assume that we do not know what the physician's opinion is regarding the relative importance of the causes stated and classification carried on in this fashion necessarily leaves much room for differences of opinion and criticism.

CANADIAN EFFORTS

In 1935 a new form of medical statement was introduced in Canada. This is almost identical with that adopted in England and Wales in 1927 and is therefore similar to the form recommended in principle for international use by the group reporting to the League of Nations in 1935⁴ and to that adopted by the Commission Mixte de Statistique Sanitaire of the International Statistical Institute at Cairo in 1928.

Before this change was made, the

The principal cause of death and related causes of importance were as follows:

Date of Onset

Other contributory causes of importance:

FIGURE IV—UNITED STATES STANDARD FORM

Committee on the Form of the Medical Certificate of the Canadian Public Health Association undertook a careful survey of the phraseology of the questions relating to cause of death in use throughout the world. The English form (Figure II) and the Swiss form (Figure III) both represent attempts to secure a logical statement and a clear separation of contributory causes which are related to and those independent of the disease to which death is attributed for statistical purposes.

The phraseology of the United States standard medical certificate was also investigated (Figure IV) in a series of trials conducted by the committee.

In addition to these and numerous other types of phraseology for the questions relating to cause of death, the committee prepared several drafts of its own. The first of these was the Minnesota certificate with the addition of a line for "terminal cause." The second is shown in Figure VI, and represents an attempt to place the burden of classification directly upon the physician. In a third draft the words "independent of underlying cause" were added to the request for a statement of "Contributory causes of importance."

It is noteworthy that the modifications made by the committee in each case moved toward the objective served

The Primary Underlying Cause of Death was	Duration
Contributory causes of importance in order of onset	Duration
(1).....	.....
(2).....	.....
(3).....	.....

FIGURE V—MINNESOTA FORM

The medical certificate used in Minnesota differs from the United States standard chiefly in the request for a statement of "Primary Underlying Cause." and in asking duration rather than date of onset (Figure V).

by the English form of statement. Thus each revision attempted to do two things: (1) to establish more clearly the certifying physician's opinion, and (2) to separate effectively contributory causes which were related to the "cause

CAUSE OF DEATH	
The Terminal Cause of Death was	
The Primary Underlying Cause (one) to Which This Death Should Be Attributed in Medical Records was	
Duration of	years months..... days
Contributory Causes of importance	
.....	
.....	
.....	

FIGURE VI—C.P.H.A. COMMITTEE'S DRAFT No. 2

CAUSE OF DEATH			
(1) Terminal Morbid Condition			Duration
(2) Morbid Condition or Injury Responsible for Train of Events Leading to Death .....			.....
(3) Important Contributory Morbid Conditions			
Related to (2) (Complications or sequelae)		Duration	
(a) .....	.....	Not related to (2)	Duration
(b) .....	.....	(a) .....	.....
		(b) .....	.....

FIGURE VII—C.P.H.A. COMMITTEE'S DRAFT No. 4

of death," from other morbid conditions contributing to death but which were of independent origin.

COMMENT ON THE FINDINGS IN CANADIAN TRIALS

In trials of the English and United States forms conducted prior to other investigations it was found that physicians preferred the English method of statement and the logical order which it called for. Trials with the drafts prepared by the committee, referred to above, were only moderately satisfactory. The additional weight which was placed on the entry of a terminal cause was found to be unjustifiable since this was usually of no significant assistance in classification. Where a single entry was made, this was often entered as the terminal

cause, the space for primary underlying cause being left blank. Having allowed three lines for the primary underlying cause, multiple causes were frequently stated there, obscuring the physician's opinion and defeating the objective.

Finally a field trial was undertaken in 8 large hospitals, using the English form with minor changes in wording⁷ and the final (fourth) draft prepared by the committee, shown in Figure VII.

The findings of this latter undertaking emphasized the fact that whatever form was introduced, education would be a large factor in getting physicians to use such a form properly, and that *after the medical questions were changed there would undoubtedly be a period of transition during which physicians would continue to use it as*

CAUSE OF DEATH	
I	
Immediate cause	(a) .....Bronchopneumonia.....
Give disease, injury or complication which caused death, <i>not</i> the mode of dying, such as heart failure, asphyxia, asthenia, etc.	due to
Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause).	{ (b) .....Operation.....
	{ due to
	{ (c) .....Strangulated hernia.....
II	
Other morbid conditions (if important) contributing to death but <i>not</i> causally related to immediate cause.	{Chronic nephritis.....
	{

FIGURE VIII—NEW CANADIAN CERTIFICATE OF CAUSE OF DEATH

if it were the old one. This has been borne out by experience during 1935 and 1936. In addition the studies demonstrated conclusively that, given the logical form of statement called for on the English medical certificate, the tabulator was provided with a better picture of the case and with more useful information to assist him in classification.⁷ It was for this reason and in view of the recommendations made to the League of Nations as well as those of the Commission revising the *International List* in 1929, and also in the light of the experience in England and Wales, that Canada introduced in 1935 the new form of medical certificate of cause of death which it now has (Figure VIII).

The new English and Canadian certificates are designed to eliminate personal bias by reversing the order of statement, calling for the immediate cause first and then others in order, making provision separately for any unrelated causes considered by the physician to have been important contributing factors in the death.

The present procedure in certification in Canada may be stated briefly thus: If the physician feels that his

case can be adequately certified by a single statement, this is entirely satisfactory. Such a statement is made under heading I, on the first line designated (a). If, however, such is not adequate, he has the opportunity of recording further information, either on lines (b) and (c) under heading I, or under II, according as the conditions to be recorded are respectively of related or independent origin in so far as the first statement on (a) is concerned. This information is sought to permit the selection of the cause for tabulation in the light of the certifier's viewpoint.

EXPERIENCE WITH CANADA'S NEW FORM

During the first 6 months after the introduction of the new form in Canada, as in England 8 years before, both the request for concise statements, and the fact that the order of statement was inverted from the old form, were disregarded by many physicians. Since that time there has been notable and persistent improvement. Table I gives the findings on the use of the new form at two intervals after its introduction in 1935.⁸ The findings in an English sample⁵ reported

TABLE I
*The Use of the New Canadian Medical Certificate**

Type of Entry	Toronto ¹		Toronto ²		England & Wales ³	
	Number	Per cent	Number	Per cent	Number	Per cent
Single entry	110	12.2	274	28.0	5,637	57.0
Multiple entry in reasonable order and without ambiguity	548	61.1	504	51.4	4,001	40.5
Inverted entry †	240	26.7	172	17.5	107	1.1
Double entry ‡			30	3.1	147	1.5
Totals	898	100.0	980	100.0	9,892	100.0

* Samples exclude stillbirths.

1. Samples taken May-August, 1935, 6 months after introduction.

2. Sample taken March-April, 1937, 25 months after introduction.

3. Sample taken March, 1935, after 8 years' experience (after Stocks).

† Multiple causes in incorrect order or location, obscuring physician's viewpoint.

‡ Two causes or more stated on one line and therefore ambiguous.

by Stocks are given for comparison.

A reduction in the number of multiple entries and a corresponding increase in single entries is of note. A reduction in the proportion of misused forms (inverted and double entries) is also gratifying. Indeed, the general consensus in Canada is that the new form represents a decided improvement over the old one and that the former confusion is being replaced by a clear statement of the opinion of the certifying physician. The younger physicians are using the form well, while those long in practice and accustomed to the old methods still frequently disregard the request for a logical sequence when multiple causes are stated.⁹ This augurs well for achievements such as have been already sighted by the English office.

DATE OF ONSET OR DURATION ON THE MEDICAL CERTIFICATE

In respect to the need for date of onset or duration on the medical certificate the general opinion in Canada⁹ is that such should not be included, particularly since it is used merely to assist in making decisions when the medical certificate is unsatisfactory. In very few instances does the record of a communicable disease contracted at an earlier date leave doubt as to classification, and such cases in view of their infrequency may readily be handled by supplementary correspondence with physicians. In just those cases in which the principal difficulty in classification arises (due to faulty certifying practice) duration is often not given, and, if given, is less likely to be reliable. For these and other reasons it was omitted from the revised form. Furthermore, the objective of the new certificate is to place the burden of indicating the cause of death for classification on the physician and not on the statistician. The difficulties which are now being experienced,

arise chiefly from conflict in the application of rules of choice where joint causes are stated.

STATISTICAL PRACTICE—RULES OF CHOICE IN JOINT CAUSE SELECTION

More faith is often placed in statistics on causes of death than is justified. An analysis of the principles upon which they are based convinces one of the serious limitations inherent in them. The medical profession is somewhat skeptical of official records of causes of death and cannot be blamed entirely for this attitude. Physicians who are cognizant of statistical practice object to the way in which their medical statements are distorted in the official routine. They feel that it does not make much difference what form their statements take, since the death of their patient is frequently attributed to a cause with which they would not agree.

Rules of choice are designed to secure the uniform selection of a single cause where joint causes are stated or in other words to counteract the effect of ambiguous or unsatisfactory death certificates. The need for them arose largely because physicians did not understand the meaning of "cause of death" for statistical purposes, and because the phraseology of the medical questions in many countries was not based on establishing clearly the "cause of death" as defined. Failing to understand what is desired officially, physicians cannot hope, nor can they be expected, to give clear and unambiguous statements for the tabulator's guidance.

Under these circumstances and in the belief that "some physicians all of the time and all physicians some of the time" would attribute major importance to a complicating condition or end result rather than to the underlying disease, a set of arbitrary rules of choice has been laid down for use except when

there are other qualifying words or phrases such as "due to" or "following" on the medical certificate, which in themselves may lead the statistician to infer a contrary ruling. This practice is quite unscientific, from the medical point of view distorts the facts, and may at best be regarded as an unsatisfactory makeshift.

WHAT DO OFFICIAL RECORDS OF CAUSES OF DEATH TELL US NOW?

The net result of the use of arbitrary rules of practice deserves careful examination. On a certificate containing two questions, (a) "Cause of Death," and (b) "Contributory Causes," it would not matter whether appendicitis or peritonitis was recorded as cause or as a contributory, since the rules give preference to the primary diagnosis. What of a case of diabetes in which tuberculosis coexists? Rules of choice give preference to tuberculosis, but actually no rigid rule can be relied upon to interpret these cases correctly for the doctor. No two of these cases are of necessity alike. From the clinical viewpoint diabetes might be the "cause" in one case and tuberculosis in the other. Unless it is desired that records of cause of death become records of the incidence of certain diseases among the population at death, arbitrary rules like the above have no scientific support, and, furthermore, they place a premium on records of certain morbid conditions to the defacement of others.

The necessity for the adoption of such rules of selection therefore arises solely out of a system of certification "under which a number of concurrent or contributory causes are stated without complete or adequate guidance from the certifying medical practitioner as to the causal relation between them." The usefulness of any code of rules applied in making assignments would be greatly modified if it could

be provided that "the certificate should itself contain such indications as would enable the selection to be determined by the practitioner's own considered judgment."¹⁰

This the English method of statement has been found to do, and there is no reason to infer that experience in Canada or elsewhere need be materially different if a similar form be used. The Conference at Paris in 1929 did not recommend the establishment of a general international code of rulings for dealing with joint causes. Indeed certain countries there represented felt "that the establishment of a rigid code for the classification of joint causes, however carefully elaborated, may have the effect of retarding the process of improving the quality of the entries in the certificates themselves, and to this extent would be undesirable."¹⁰ The achievements in respect to certification in England strongly suggest the immediate need for serious thought to be given by other countries to the methods and objectives adopted there.

The rigid principles of joint cause selection tend to prevent official records of causes of death from being a sensitive index of medical achievement. Diabetes and cancer are two illustrations. Let us consider this point, keeping in mind that official records should reflect in so far as is possible, the considered opinion of an enlightened medical profession on the diseases which are fundamentally responsible for death.

DIABETES

In 1936 a confidential study of all deaths in which diabetes was mentioned on the death certificate in Ontario during a 12 month period, was undertaken in the School of Hygiene at the University of Toronto.¹¹ It became evident that no uniform arbitrary scheme for the selection of one cause

where an *in situ* survey was conducted, and
even to estimate the size of the population
the present status of general health in
the district, and to determine the
needs of the community. The survey
was conducted in the district of the
population of the district, and the
population of the district.

There are many people who are not aware of the fact that the United States is a country of immigrants. The first wave of immigration came from Europe in the 19th century. The second wave came from Asia and Latin America in the 20th century. The third wave came from Africa and the Middle East in the 21st century. The United States is a country of immigrants, and it is important to understand the history of immigration in order to understand the United States today.

It is a fact that the majority of the people who are in the position of being able to do this are the people who are in the position of being able to do this.

[illegible][illegible][illegible]

11

1. 2. 3. 4.

Cause of Death	
I	Chronic degenerative myocarditis
Immediate cause	
Give increase, support, or condition then which caused death, not the mode of dying, such as heart failure, apoplexy, aneurysm, etc.	
Mediate conditions, if any, giving the immediate cause (start in order proceeding backwards from the mediate cause).	
II	Diabetes mellitus
Other morbid conditions (if important) contributing to death but not essentially related to immediate cause.	

Figure 5

TABLE II
*Classification of 602 Deaths
 Among Diabetics
 Ontario, 1935*

Physicians' Opinion	National Practice *		Total
	Diabetes	Other Causes	
To diabetes	218	22	240
To other causes	213	102	315
Not stated	40	7	47
Total	471	131	602

* Except diabetes preferred to lobar pneumonia.

The General Register Office in London, England, in 1935 reported upon a small sample of 121 medical certificates assigned to diabetes under statistical rules.¹² Of these 42 contained a statement of diabetes alone and 79 multiple causes. If the order of preference indicated on the certificate had been followed, 30 of the latter would have been assigned to other causes, giving 91 diabetic deaths or only 75 per cent of the original total. At the same time an inward transfer of 5 deaths would have occurred from other causes—a net loss of one-fifth. These data show that present practice fails to reflect accurately medical opinion.

CANCER

It is generally conceded that official statistics on cancer as a cause of death present errors in excess. The extensive preference given to cancer over other jointly stated causes has served to provide more nearly a statement of the incidence of cancer among the population at death than a measure of the mortality attributable clinically to this cause. Merely because an individual has a cancer, particularly if it is one of the accessible group of sites amenable to surgery, radium, X-ray, or a combination of these, is not sufficient reason why rigid preference should be given to it over causes of in-

dependent origin. Because cancer was present in the patient at death is not sufficient justification for attributing that patient's death to cancer.

Part of the solution to this particular difficulty lies in a medical statement which permits the physician to indicate clearly his own opinion and to say whether he thinks cancer was the important factor in death. *If it did not contribute to an important extent it should not be mentioned on the death certificate at all.*¹³

It has been urged that internationally uniform rules of preference where joint causes are stated would be a step toward comparability of records of causes of death on an international basis. This is an illogical contention since it implies that this in itself is the major source of the basic differences which now exist. There are many illustrations of incomparability traceable to this factor of course, but unless fashion of certification, unless the medical profession in various countries are informed upon the principles of medical certification, and unless the medical certificates are identical or essentially similar in plan the world over, international comparability of records will remain the myth it is today.

DISCUSSION

Many factors influence the completeness and accuracy of medical statements of cause of death. Of these, the form and phraseology of the questions relating to cause of death are ones whose influence upon the physician's report has been inadequately considered.

To define "cause of death" for the purpose of medical records as the "disease or injury which initiated the train of events leading to death" and to tabulate all records in the light of this definition is a major step toward securing sound practical information, if cognizance be taken of medical

opinion. Any attempt to make mortality records reflect disease incidence, and arbitrary rules in joint cause practice tend to do this, is open to objection and to failure because the viewpoint of the attending physician in many cases has to be disregarded and because mortality data can never serve as a reliable index of the incidence of disease among the population at death.

The history of attempts to improve medical certification is a history of attempts to find a means of making clear to the physician what is desired and to secure his full coöperation. Given a clear definition of the purpose of mortality data and an understanding by everyone of the significance of "cause of death" for statistical purposes through educational efforts which include the certifying physician, the problem resolves itself into one of phrasing the medical questions so that ambiguity is eliminated.

Completeness of medical statements is of secondary importance to accuracy. Accurate statements are ones which are adequate to give a clear expression of what "caused" death. A medical statement can be accurate and adequate for this purpose and yet, in the minds of some, be quite incomplete. Completeness should be considered as something ideally useful, virtually unattainable except in hospital experience, and, from the practical viewpoint, of little concern at the moment.

For many years we have pointed with pride to the declining proportion of deaths classed to "Cause of Death Not Specified or Ill-Defined." This pride is unjustifiable since this trend is in some measure due merely to the fact that physicians have been made to feel that in all deaths due to natural causes some specific statement *must* be given. They therefore often make statements which they have no evidence to substantiate. It would be far better to encourage physicians to state "cause

unknown" or "unknown disease" when they find it impossible to make a scientific statement.^{14, 15, 16} Statistics on causes of death could be much improved if all deaths for which the cause could not be reasonably well determined by the physician were so specified and so classified. Better to have 10 times the number of deaths classed to "Cause Unknown or Ill-Defined" than to have them included under headings where they very likely do not belong at all.

The question of the most desirable and satisfactory phraseology for the questions relating to cause of death on the medical certificate, is one of supreme international as well as national importance. We cannot afford to ignore the broad implications involved. Less stress on statistical rules and their uniformity and more on securing the certifier's viewpoint, is what we need today.

SUMMARY

1. Three aspects of medical certification deserve consideration, namely, education of the medical profession in the principles and practice of death certification, the form of the questions relating to cause of death, and the statistical practices to which medical statements are subjected in tabulation.

2. The achievement of accurate medical statements which reflect the considered opinion of the medical profession is an urgent need and depends first upon the physician clearly understanding the significance of the questions relating to cause of death and the general principles of death certification, including a clear conception of what is meant by "cause of death" for statistical purposes.

3. A lasting service to preventive medicine can be performed by each physician who produces authoritative and logical certificates of cause of death, and time should be found in the curriculum of medical schools to impress the essential points upon each student.

4. Satisfactory phraseology of the medical questions must fulfil two requirements: (a) give the physician the opportunity to express clearly his opinion as to the cause of death in each case, and (b) effectively separate contributory causes which are related to the disease causing death from those which are

considered to be contributory factors but independent of the underlying cause of death.

5. English experience has conclusively demonstrated the workability of a form which fulfils all the requirements which are necessary to an intelligent statistical assignment. Beginning in 1941, selection of the cause of death for tabulation is to be based on the certifier's opinion as gathered from a literal reading of the certificate, in place of selection by rule.

6. The existence of so many different types of phraseology of the medical questions the world over is in itself a serious source of incomparability of records on an international basis, and significant progress in this direction will be attained with the achievement of a uniform program for the medical certificate in all countries using the *International List of Causes of Death*.

7. Canadian experience since 1935 with a new form of medical statement similar to that introduced in England and Wales in 1927, as well as to that suggested by a group reporting to the Health Committee of the League of Nations in 1925 and subsequently by the Commission Mixte de Statistique Sanitaire of the International Statistical Institute at Cairo in 1928, has been gratifying and augurs fair for achievement of the objective of being able to accept the certifier's viewpoint in place of selection by rule.

8. A request for duration should not be included on the medical certificate among other things because (a) in many instances it is not reported upon and even when it is there is no plausible guarantee of accuracy, (b) the importance attached to it through assignment based on relative durations is merely a makeshift, failing a reasonable statement of medical opinion on the certificate, and (c) the ultimate objective, if scientific records of the causes of death are to be compiled, must be to place the burden of indicating the cause of death for tabulation upon the physician and not on the statistician.

9. Existing statistics on causes of death have serious limitations, traceable to the application of arbitrary rules under which they can never succeed in reflecting medical opinion. This they should be expected to do, and indeed must do, if any real significance is ever to be attached to them in practice.

10. Diabetes and cancer are just two instances of inaccuracies resulting from the rules of joint cause selection. Present methods tend to make statistics of causes of death a measure of the incidence of such diseases

among the population at death, understating certain others as a result.

11. Existing practices are shown to lead frequently to an assignment with which the physician would not agree. *Part of this difficulty may be attributed to lack of appreciation by physicians as to what is desired on the form.* Many seem to regard it as a place for an abstract of the clinical history and pathological findings, which it certainly is not. What is desired is a terse scientific statement of the disease or condition responsible for death. Only important states should be mentioned, and while it appears to be implicitly thought that this is uniformly observed by the profession, nothing is more certain than that it is not. *If a disease or condition is clinically not an important contributor to death it should not be mentioned on the certificate at all.*

12. Anything approaching complete international agreement as to a uniform code of rules for the selection of one cause for tabulation where multiple causes are stated can never achieve anything of fundamental value toward international comparability of mortality statistics. Unless the medical profession be properly educated and instructed in the use of the medical certificate and unless medical certificates are similar in plan the world over, international comparability of medical records will remain the myth it is today.

13. Less stress on statistical rules and their uniformity and more on securing the certifier's viewpoint should be a guiding principle in the future.

14. The question of the most desirable and satisfactory phraseology for the questions relating to cause of death on the medical certificate remains still the important problem of the moment, and one of supreme national as well as international import.

REFERENCES

1. Second Annual Report of the Committee on Certification of Causes of Death. *Canad. Pub. Health J.* 26:403, 1935.
2. Stocks, Percy. *Lancet*, 229:386, 1935.
3. Recommendations of Commission Revising the International List in 1929. *Manual of the International List of Causes of Death*, published by the Dominion Bureau of Statistics, Ottawa, Canada, 1933, page xvi.
4. *Report of the Group Entrusted with the Study of Causes of Death*, League of Nations Health Committee, Fourth Session, C.H. 288, 1925.
5. Personal Communication, General Registrar Office, London, March 12, 1936, and Report by Dr. Stocks to the Registrar-General, dated November 8, 1935.
6. *Registrar-General's Statistical Review, England and Wales*, Text 1927.
7. Report of the Committee on the Form of the Certificate of Death. *Canad. Pub. Health J.* 25:337, 1934.
8. Fourth Annual Report of the Committee on

Certification of Causes of Death. *Canad. Pub. Health J.*, 28:507, 1937.

9. Third Annual Report of the Committee on Causes of Death. *Canad. Pub. Health J.*, 27:404, 1936.

10. *Manual of the International List of Causes of Death*. H. M. Stationery Office, London, England, 1931, pages v and vi.

11. Defries, R. D., and Sellers, A. H. Unpublished data.

12. Personal communication with Dr. Percy

Stocks, General Register Office, London, England, October 25, 1935.

13. Hill, A. Bradford. Correspondence in *Lancet*, 228:770, 1935.

14. Bundesen, H. N., et al. *J.A.M.A.*, 109:337, 1937.

15. *Handbook on Death Registration and Certification*. Published by the Dominion Bureau of Statistics, Ottawa, Canada, 1936, page 17.

16. Defries, R. D., and Sellers, A. H. *Canad. Pub. Health J.*, 27:160, 1935.

Deadliest Drivers Are Boys

DEATH behind the driver's wheel, in the terrible annual auto accident toll, is not a grim, old, bearded man with a scythe. He wears the beardless face of a boy. Flaming youth at the wheel is the deadliest foe of today's highway-using public.

Remorseless statistics, presented before the American Association for the Advancement of Science by a critically analytic scholar, prove the indictment beyond possibility of denial. Dr. Harry M. Johnson, who led the study under the auspices of the Highway Research Board, sums up the case briefly and dramatically:

"If we pick the same number of drivers in each age group, and count the fatal accidents that each group has,

we find that those who are 45 to 50 years old kill the fewest persons in a year. While they are killing 66, the 16 year olds are killing 201, the 17 year olds 186, the 18 year olds 148, and those between 19 and 21 are killing about 215 persons for each 100,000 drivers on the road. . . .

SECOND DANGEROUS AGE

"The drivers older than 45 tend to become more deadly each year, reaching the average rate for the whole population about age 64 to 65, whereupon the rate suddenly falls. This decline may be due to the older drivers driving less and less, instead of better and better."—Dr. Frank Thone, *Science News Letter*, March 5, 1938, p. 150.

Organisms Involved in the Pollution of Water from Long Stored Feces*

LELAND W. PARR, PH.D.

*Department of Bacteriology, Hygiene and Preventive Medicine,
School of Medicine, The George Washington University,
Washington, D. C.*

OBVIOUSLY one of the most important factors controlling the flora of stored feces is the bacterial picture of the feces before storage. The complexity of this original flora is almost beyond belief. Of the many microbes present only those of interest to pathology or others which may serve as indicators for fecal pollution are at all well known. Omitting frank pathogens from consideration, fresh fecal specimens may contain coliform bacteria, enterococci, classical anaerobes, non-sporing anaerobes, yeasts, spirochetes, staphylococci, lactobacilli, thermophilic bacteria, aerobic spore-bearers, *Pseudomonas*, and reputedly even the "Bacillus P" of Clemesha,¹ molds, algae, *Proteus*, *Alcaligenes*, and Friedländer's bacillus. The "inapparent" viral content of the bowel can only be guessed at and in its environment bacteriophage activity may be considerable.

Again, it is now well recognized that the flora of the individual differs from time to time even when that individual is in normal health and on a relatively stable diet. Occasionally no coliform bacteria can be detected, and at other times though coliform organisms may

be present *Bacterium coli* in all its varieties may be absent, the only group organisms present being the citrate-utilizing *Bacterium aerogenes* or coliform intermediates (Parr^{2,3,4}; Carpenter and Fulton⁵). Bailey⁶ has reported a colon carrier of typhoid bacilli yielding practically a pure culture of *Eberthella typhi* and Sandholzer⁷ a case in which the only organisms recovered were *Pseudomonas*. Parr⁸ has recorded one subject in whom only chromogenic colon bacilli were present and another in whom the sole aerobic fecal flora was paracoli. Some years ago Van der Reis⁹ had a patient with a secondary anemia from whom a practically pure culture of *Clostridium tetani* was recovered.

Thus we know that fresh fecal specimens may be encountered which can pollute water without detection by the bacteriological methods now in use. Happily such specimens are not common and probably figure very little in sanitary problems involving communities. Nevertheless, even in modern society, many factors still operate for the individual pollution of food and drink and, indeed, in recent years there has been an increase in such opportunities through the rise of a large transient population, improvident and otherwise.

As long as bacteriologists can be

* Read before the Laboratory Section of the American Public Health Association at its Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

satisfied that all outbreaks of gastrointestinal distress, transmitted by water, are caused by well known and clearly recognized pathogenic forms of enteric bacteria one might suppose but little need exists for detailed study of the flora of feces, fresh or stored. Such is not the case. No aspect of bacteriology offers a better field for studies in bacteriological ecology, in the origin and interrelation of bacterial species, and in microbic genetics than does intestinal bacteriology. Sanitarians pose questions of great practical importance regarding indices of pollution, recent pollution, human versus animal pollution, and the like which are still unanswered. There is no bacteriologist who has not been impressed by the fact that within a few hours following the drinking of sewage polluted water illness appears which may or may not later be followed by cases of amebic dysentery or typhoid fever. What bacterial component of the sewage causes the earlier aspects of this well known phenomenon, and how?

Again, from time to time, bacteria are reported as causes of disease whose exact nature or place in the intestinal flora is not clearly understood; for example, "*B. coli mutabile*," slow-lactose fermenters, "*B. alkalescens*," Morgan's bacillus, and paracoli. Finally, sanitary science is increasingly meeting with cases of individual or mass disease, apparently water-borne, for which no etiological agent can be named, and occasionally when the water in question, by present standards, appears to be potable.

In the endeavor to obtain a better understanding of these problems we have been led to consider the part bacteria from stored feces may play. This interest has been accentuated by studies of the 1930 and 1931 records of illness in the Ohio Valley during widespread drouth and by the implications arising from our studies on the

normal flora of fresh and stored feces in the human.

That long stored feces will contain bacteria different from those encountered in a study of fresh feces should be evident from an appreciation of the principles of ecology. For fecal specimens, protected during storage from admixture with non-fecal bacteria, the new bacterial picture can be explained on two different grounds.

It is possible that some of the bacteriological changes observed may be due to bacterial variation—the loss of characteristics or the acquisition of new ones apparently giving rise to new organisms. This may be the origin of slow-lactose fermenters, "*B. coli mutabile*," or even paracoli from *Bacterium coli*.

On the other hand most of the evidence suggests that the bacteriological changes observed as fecal specimens are stored are to be explained as successions of forms based on facility of adaptation to the environment presented under conditions of storage. The first real study of the effect of storage on feces was made by Jordan,¹⁰ who utilized fecal masses stored in tight containers. Some of the masses were uncovered and others were covered with soil or with sand. Four temperatures were used—body, room, ice box, and —11° C. Jordan found that when feces leave the body there is a short period of multiplication of the bacteria they contain, later followed by a numerical depression. This takes place at all temperatures but is most rapid at the temperature of the body. This was explained on the theory that in the bowel some sort of inhibitive factor operates which is absent from the excreted feces. Jordan did not analyze the bacteria involved in any great detail but he did determine that the multiplication he observed was not that of *Bacterium coli* but of other bacteria present in the feces. *Bacterium coli* is

eventually eliminated from stored feces, most rapidly at body temperature, most slowly at -11°C . At this last temperature Jordan found that coli persisted for 2 or 3 months.

In this paper we shall discuss but two of the bacterial groups important in feces. For more than 4 years we have been studying the normal flora of fresh and of stored feces in the human subject. During this period 235 specimens from 100 persons have been studied in some detail. Thirty-eight of these specimens have been studied stored at 37°C ., and more than half have been stored in the cold room with storage studies completed on 68. The feces were stored as heavy saline suspensions. Endo's agar was used for direct plating, the 38 body temperature storage specimens being plated 183 times, and the 68 from the ice box 368 times. With a very few exceptions the 37°C . and ice box storage specimens are duplicates prepared from the original fresh specimen on which study of the flora of fresh feces was made. Enrichment by lactose broth followed by plating was only used where adequate direct plating failed to yield growth.

The 2,595 colonies isolated in these 551 platings were carefully purified and subjected to detailed pure culture study. Results were recorded in terms of coli, coliform intermediates, and aerogenes through utilization of the four tests comprising the "Imvic" reaction,² namely indol production, methyl-red reaction, Voges-Proskauer reaction, and citrate utilization. A number of other determinations were made for each culture and form a part of the complete record.

We early found that about 9 per cent of all fresh fecal specimens studied to determine their coliform content contained only *Bacterium coli* in one or more of its fermentative varieties. It is true that the original routine analysis of the fresh specimens

revealed about 3 times this number of "coli only" specimens. However, by unusually detailed study of the fresh specimen or by following it carefully through storage, two-thirds of these were found to have originally contained a few citrate-utilizing coliform bacteria which as storage progressed developed at the expense of the coli and dominated the coliform picture after a few weeks of storage.

For the coliform bacteria there are then two pictures to be seen in stored feces. When the original fresh specimens (9 per cent) contain only *Bacterium coli*, no amount of storage will bring about the presence of any other type of coliform organism. Specimen No. 4 illustrates the point. In ice box storage this specimen yielded coliform bacteria for 359 days. During this period it was plated on Endo 22 times and 124 colonies were given pure culture study. Each culture was *Bacterium coli* and even the last isolations appeared on Endo and in culture as "typical" colon bacilli. Similar results were obtained with specimens Nos. 57A, 88, 92, 95, and 118. These 6 specimens were obtained from 5 different subjects. It is thus possible for a stored fecal specimen to yield "typical" *Bacterium coli* for a very considerable time. It is important to realize that in such specimens *Bacterium coli* persists despite considerable competition offered by other bacteria present in the specimen which are not coliform, such as enterococci, spirochetes, classical anaerobes, and *Bacteroides*. *Bacterium coli* cannot, therefore, be unqualifiedly considered as the indicator of recent fecal pollution.

The more common picture as far as coliform bacteria is concerned is observed when the original fecal specimen contains citrate-utilizing coliform bacteria as well as *Bacterium coli*. The citrate-utilizers (aerogenes, cloacae, coliform intermediates) multiply in

storage very much more readily than do the coli, and eventually completely replace them. Along with this change we observe an increase in the proportion of strains which ferment lactose slowly or with acid production only, and an increase in gelatin liquefiers.

Such specimens will not number 91 per cent for we have found that in any large series of fresh fecal specimens there will be some from which no coliform organisms can be isolated. Thus among 194 such specimens from adults 4 were encountered deriving from 3 persons which failed, even with enrichment, to yield coliform organisms, and there were 7 specimens likewise coliform negative among 41 specimens obtained from normal babies less than 2 weeks old.

Recovery of coliform organisms can be made after long intervals of storage of fecal specimens in the vast majority of instances. Parr¹¹ has elsewhere discussed the viability of coliform organisms in culture and in other environments. One further illustration will clarify the point and extend his earlier remarks. Specimen No. 3, as a fresh specimen, on direct plating yielded only *Bacterium coli* (15 colonies studied). Under conditions of storage in the ice box the coli diminished in number and citrate-utilizers appeared ultimately pushing the coli completely out of the picture. When last plated out this specimen still yielded citrate-utilizing coliform bacteria after an interval of storage amounting to 3 years, 10 months and 2 days. The period of survival is shortest at 37° C. and longest when the suspension is stored in the cold. Among the coliform types noted in such long stored fecal specimens are some similar to, if not identical with, slow-lactose fermenters, "*B. coli mutabile*," "*B. coli anaerogenes*" and even the "*B. alkalescens*," and paracoli mentioned in some connections as pathogenic.

The second bacterial group to which a short preliminary discussion will be devoted is that which goes for the time under the name "*Bacillus P.*" In India, Clemesha¹ was convinced that it was next to impossible to obtain water for drinking purposes which would meet British standards. He proceeded to work out a method of bacteriological control applicable to the climate and conditions of India. He proceeded on the hypothesis that some strains of coliform bacteria might be more indicative of fresh fecal pollution than others. To find which these were he prepared suspensions of feces which he exposed in shallow dishes to the action of sunlight. Isolations were made at short time intervals. Clemesha found that certain forms could be recovered from fresh feces and for a few hours from the exposed suspensions. These were, however, shortly replaced in the suspensions by other forms, and these in turn by yet others, until at last all lactose fermenting aerobes had disappeared. There then remained Gram-negative, non-sporing aerobes which he called "*Bacillus P.*" Beyond noting their resistance to the action of sunlight under the conditions of his experiment, Clemesha did nothing with these forms save to suggest that they were probably a group of bacteria and not a single species.

In our study of stored fecal specimens we have encountered these organisms. After a few weeks of storage they begin to appear and in most long stored fecal specimens "*Bacillus P.*" occur in large numbers. When plated on Endo they grow as small, colorless colonies. The organisms exhibit a variety of biochemical activity, are in the main motile, and do not produce acid and gas from lactose even after repeated and prolonged incubation. All of the group in colony appearance, and some in culture, resemble paratyphoid, typhoid, and dysentery bacilli

and may be mistaken for them. Furthermore, certain of the strains give serological cross-reactions with these known enteric pathogens. Possibly the "Bacillus P" may be involved in gastroenteritis, apparently water-borne, since organisms similar to those we have under study have been reported from such outbreaks.¹²

Parr and Caldwell¹³ encountered similar organisms in great numbers in water deriving from wells yielding old fecal pollution as shown by chemical tests. Parr¹¹ again mentions them in a study on the viability of coliform bacteria and elsewhere³ he states they may occasionally be found in small numbers in fresh feces.

Data are available for 35 strains of the "Bacillus P" which we have isolated from long stored feces stored in the cold and in a few instances from fresh feces. The strains were purified by repeated plating and were then subjected to detailed pure culture study. From 6 strains, examples of different cultural types, antisera have been prepared. Of the 35 strains 11 do not ferment any sugar. Eighteen strains produce acid but no gas in dextrose broth, and of these, 7 also ferment lactose to the same degree, but are not in colony appearance or in other reactions suggestive of "*B. coli anacrogenes*." Six strains ferment dextrose producing both acid and gas. Two strains produce hydrogen sulphide and 6 liquefy gelatin. Of these last one is a typical *Proteus* but the other 5 are not. The "Imvic" reaction (vide supra), which is applied to coliform bacteria divides the 35 strains into 5 groups (— — — +, — — — —, + + — —, — + — +, and — — + +), but these divisions do not correlate with fermentation and other cultural differences.

Five of the antisera prepared with these organisms have been tested against 10 appropriate known strains—

E. typhi, *S. sonnei*, *S. paradysenteriae*, *S. paratyphi*, *S. Schottmuelleri*, *S. enteritidis*, *S. cholerae suis*, *S. aertrycke*, *Proteus X₂*, and *A. fecalis*. No relationship was shown for Sonne's dysentery bacillus but cross-reactions occurred for *E. typhi* and *S. paradysenteriae*. Several of the strains suggest *Alcaligenes fecalis* culturally but the serum with one of them gave only a feeble agglutination reaction with a known *Alcaligenes fecalis*. Strongest cross-reactions were obtained with the human types of *Salmonella* against our serum No. 2, prepared with one of the "Bacillus P" organisms culturally resembling paratyphoids. Against a known *S. paratyphi* this serum effected complete agglutination in a dilution of 1/320, the titer of the serum with its engendering organism being 1/5120.

Such reactions mean no more than some degree of common antigenicity, but are sufficiently suggestive to warrant interest in the "Bacillus P" organisms. The group may have some sanitary significance, particularly under conditions permitting fecal storage in nature. It is possible that "Bacillus P" may be the group involved in the multiplication of bacteria in stored feces indicated by Jordan. Certainly their taxonomic position should be investigated and their relationship to the colon-typhoid groups clarified.

CONCLUSIONS

Some of the principles and theories underlying the development of a fecal flora in stored feces are discussed. Data derived from a study of 2,595 coliform colonies isolated from platings of stored feces permit a statement of the part played by the genus *Bacterium*. The "Bacillus P" of Clemesha is discussed and its rôle in stored feces indicated.

REFERENCES

1. Clemesha, W. W. *The Enterology of Surface Waters in the Tropics*. Calcutta, 1912.
(References continued)

2. Parr, L. W. Sanitary Significance of the Succession of Coli-Aerogenes Organisms in Fresh and in Stored Feces. *A.J.P.H.*, 26, 39 (Jan.), 1936.

3. Parr, L. W. Succession of Colon-Typhoid Organisms in Normal Human Feces. *J. Bact.*, 33, 75 (Jan.), 1937.

4. Parr, L. W. Occurrence and Succession of Coliform Organisms in Human Feces. *Am. J. Hyg.* In press.

5. Carpenter, P. L., and Fulton, M. Escherichia-Aerobacter Intermediates from Human Feces. *A.J.P.H.*, 27, 822 (Aug.), 1937.

6. Bailey, J. H. Personal Communication, 1936.

7. Sandholzer, L. A. Personal Communication, 1936.

8. Parr, L. W. Unrecorded Form of *Bacterium aureum*, sole Colon-Group Representative in a Fecal Specimen. *Proc. Soc. Exper. Biol. & Med.*, 35, 563 (Jan.), 1937.

9. Van der Reis. Cited by Bauer, J. H., and Meyer, K. F. Human Intestinal Carriers of Tetanus Spores in California. *J. Infect. Dis.*, 38, 295, 1926.

10. Jordan, E. O. The Changes in the Bacterial Content of Stored Normal and Typhoid Feces. *J. Infect. Dis.*, 38, 306, 1926.

11. Parr, L. W. Viability of Coli-Aerogenes Organisms in Culture and in Various Environments. *J. Infect. Dis.*, 60, 291 (May-June), 1937.

12. Cooper, M. L. Unpublished data.

13. Parr, L. W., and Caldwell, E. L. Unpublished data.

The Business of Thinking

... All these things not only limit research activities in the laboratory, but effectively abbreviate and depreciate the important business of thinking. We are all familiar with the scientist who is endlessly active, but who seems to gallop all day on a ten-cent piece like a diminutive broncho plunging about endlessly and getting nowhere. Too evidently, such scientists are not indulging in the business of thinking and especially of asking questions as to the meaning of things and the planning of sound procedures to answer these questions. It should be axiomatic that the scientist must have time to think. His translatory activity in the laboratory, unsupplemented by adequate thought activity, is equivalent to

driving madly through the night across the prairie without headlights on his car and is likely to terminate in such accidents or such arrivals at or near his point of departure as find their way into scientific papers to the distress of all critical minds. Such papers seem equivalent to the "Local Items" in the country newspapers. Thinking is the searchlight which enables us to see where we are going, and to perceive such side roads as should be noted for subsequent exploration, and too obviously most of us are following established modes of research most of the time without much of what could be properly termed real thought. . . .
—Dr. Maurice C. Hall, *Sci. Month.*, Feb., 1938.

Preventive Aspects of Crippling Diseases*

H. E. HILLEBOE, M.D.

*Director, Division of Tuberculosis and Services for Crippled Children,
Minnesota State Board of Control, St. Paul, Minn.*

IT is particularly opportune at this time to consider the preventive aspects of crippling diseases because of the great public attention which is being focused on the crippled child. This increased interest is largely the result of the extension and improvement of services for crippled children made possible by the passage of the Social Security Act. In providing care for the crippled child, one must not lose sight of the cardinal principle of public health that prevention is the only real cure for preventable diseases as well as being the most economical and the most effective. This principle applies to the actual prevention of deformities and disabilities in the normal child as well as to the preservation of function and prevention of additional deformities in the child already crippled. It is the purpose of this paper to present some of the more recently developed methods of attack on the preventive aspects of disabling diseases in crippled children.

In order to approach a problem of this magnitude logically, it is necessary to determine the extent of crippling conditions and the variable factors involved in the order of their importance and amenability of correction. The data to be presented have been accumu-

lated over a period of years in Minnesota, whose population is approximately 2,500,000, of whom 50 per cent live in rural areas, embracing a territory of over 84,000 square miles. These factors are of importance when one considers methods of approach in a program of preventive medicine for crippled children where children must be contacted in their own rural homes.

In this state there are approximately 1,000,000 children under 21 years of age. On July 1, 1937, there were 8,300 crippled children under 21 years of age, an incidence of 8.3 per 1,000, on the central registry of the official agency. This registry does not include children with eye or ear defects alone, but includes a small proportion of non-orthopedic crippling conditions.

From an analysis of the cases under 21 years of age on the central registry, it has been determined that the causes of the disabling conditions are distributed in arbitrarily classified groups as follows: accidents, 11 per cent; anterior poliomyelitis, 20 per cent; arthritis, 2 per cent; cerebral palsies, 14 per cent; congenital deformities, 25 per cent; muscular dystrophy, 1 per cent; osteomyelitis, 4 per cent; rickets, 5 per cent; scoliosis of unspecified etiology, 1 per cent; tuberculosis of bone and joint, 3 per cent; and a miscellaneous group, 14 per cent.

On the basis of White House Conference reports of surveys, there are

* Report of Activities of Division of Services for Crippled Children to the Members of the Advisory Committee, November 1, 1937—Read at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

not less than 350 blind children and 1,000 children with serious partial visual handicaps under 21 years of age in Minnesota. The same general methods of approach to the preventive aspects of other crippling diseases are also applicable to children with defective vision. In addition, there are special methods for diagnosing defective vision which must be employed. Special classes, as well as medical treatment facilities, must be provided also. The principles involved in the preventive aspects of all handicapping conditions, however, are practically the same with minor variations.

In a group of 1,274 children crippled from anterior poliomyelitis, the age of occurrence of the disease in Minnesota is as follows: under 1 year, 7 per cent; 1 to 4 years, 49 per cent; 5 to 9 years, 30 per cent; 10 to 14 years, 11 per cent; 15 to 19 years, 3 per cent. In this group of cases, the percentage distribution by age group does not differ significantly by sex. When the distribution of occurrence of disability is correlated with the age of first hospital treatment, it is found that there is quite a lapse in the age at which treatment is given in relation to the age at which disability first occurred. In 227 male children crippled by anterior poliomyelitis who were admitted to the state hospital, 71.8 per cent did not enter the hospital until 3 or more years after the occurrence of the disease; 50.6 per cent, until 4 or more years; and 38.3 per cent, until 5 or more years after the initial attack.

Bone and joint tuberculosis presents a very interesting preventive problem in this state. It is noted that less than 3 per cent of crippling conditions are due to bone and joint tuberculosis. This particular field offers untold opportunities for practising preventive medicine. The age of occurrence of 219 cases of bone and joint tuberculosis in crippled children in Minnesota

is as follows: under 1 year, 3 per cent; 1 to 4 years, 39 per cent; 5 to 9 years, 20 per cent; 10 to 14 years, 6 per cent; 15 to 19 years, 1 per cent; undetermined age under 21 years, 31 per cent.

When the first state hospital for crippled children was started in Minnesota in 1897, it was estimated that 70 per cent of the children who came to the hospital were disabled because of bone and joint tuberculosis, according to the present Chief of Staff of the State Hospital for Crippled Children. It is noteworthy at this time, 40 years later, to be able to say that less than 3 per cent of the crippling conditions found among children in the state are due to bone and joint tuberculosis, and that less than 1 per cent of the admissions to the state hospital are necessitated by bone and joint tuberculosis.

Better methods of tuberculosis control, such as improvement in the hygienic conditions, the standards of living, and the facilities for sanatorium care, have been of value in obtaining this marked decrease. One factor is probably of more importance than any other single factor—the eradication of tuberculosis among cattle. Every county in the state is accredited for tuberculosis in cattle, which means that there is less than $\frac{1}{2}$ per cent tuberculous infection in the cattle in the entire state. The type of organism usually found in the lesions of bone and joint tuberculosis in children is the bovine strain, which indicates that the original infection probably came from milk from tuberculous cows. As to this particular phase of the preventive problem of crippling diseases, the livestock sanitary group must be relied upon to assist in reducing the amount of bone and joint tuberculosis in children.

Additional factors have an important bearing on the preventive aspects of crippling conditions: (1) the age at which the disability occurs, which must

be considered in relation to the time at which treatment is first started; (2) accessibility and extent of hospital facilities and out-patient facilities for the care and medical treatment of crippled children; (3) provision for and method of follow-up of children who have been brought under the supervision of the state agency.

With due consideration of the fact that a sound educational program for the actual prevention of crippling diseases in normal children must be carried on, the official state agency has emphasized that part of the work concerned with the preservation of function and prevention of further deformities in the child already crippled, because the state agency has the facilities and field personnel necessary for the extension and improvement of this phase of the program.

The orthopedic surgeon cannot provide medical care unless patients are made available to him. It is in this part of the program that special public health tools and methods are especially effective, and must be considered an essential part of the therapeutic resources. The tools referred to are public health nursing service (including physiotherapy) and crippled children clinics in rural areas.

The field nursing service is the connecting link between the official state agency and the crippled child living in the rural community. The public health nurse discovers new cases and reopens old cases which have prematurely ceased treatment. She does follow-up work on discharged hospital patients in coöperation with the medical social worker. She carries on a preventive educational campaign in every part of her work. She prepares the local community for the proper reception of field clinics, and, in addition, makes the necessary investigations to determine which new and which old cases should come to the clinics.

She acts as a consultant to local school and county nurses in problems related to crippled children.

Whenever possible, local resources are used in obtaining information about and care for crippled children. This coöperative activity with local nursing and welfare workers is economical and avoids duplication of effort. It is imperative that numerous public health workers from different administrative agencies avoid multiple interviews of a family group for the same purpose when one worker can get the necessary information for all concerned.

Some of our public health nurses are also qualified physiotherapists. These nurses supervise the actual physiotherapeutic procedures on crippled children in their homes as recommended by the orthopedic surgeons, and, in addition, give a certain amount of physiotherapeutic treatment. This follow-up physiotherapy field service is one of the best means of preventing further deformities, particularly contractures, in crippled children who have had initial surgical treatment. The physiotherapists act as instructors and consultants to local public health nurses and are well trained to carry on an educational program for the prevention of crippling diseases.

An analysis of the records relating to the field nursing service during the past year brings out some very pertinent statistics. Public health nurses working in an area of over 84,000 square miles admitted 2,393 cases to the nursing service during that time. Of this group, 1,088 were new cases reported to the registry. In spite of the fact that at the beginning of this service there were approximately 5,000 known crippled children under 21 years of age in the state, the nurses were able to locate 1,088 additional cases in one year. This was an outstanding contribution to the program for crippled children by the field nursing service.

There was a definite shift in the age distribution toward the younger age groups in the cases found by the nursing service in comparison with the age distribution of all the known cases on the register. In addition, there was the added factor of importance in this service that, once these cases were discovered, means could be found to place these crippled children under adequate medical supervision.

In reviewing the visits made by the two physiotherapy nurses working throughout the state, it is noted that 1,257 physiotherapy visits were made. When it is remembered that physiotherapy is a very important part of the program of prevention of deformities in children already crippled, one can appreciate the value of such service even though it be difficult with a limited personnel to render this service over a large territory.

In an area in which there are public health nurses available for general public health duty, it is felt that the crippled children's division should develop a specialized physiotherapy nursing service. These nurses should have sufficient training in physiotherapy to insure that their work will be acceptable to the orthopedic surgeons in charge of the cases so that actual physiotherapy supervision and treatment recommended by the orthopedic surgeons can be given in the homes. The amount of training required to accomplish this must be determined by the orthopedic surgeons, the physiotherapists, and the schools of nursing. It is felt, however, that public health nurses who are acceptable as physiotherapists can serve in many different and important capacities not otherwise possible.

Field clinics have proved to be one of the most effective weapons in the prevention of further disability in children already crippled. The clinic is also of value as an educational means of acquainting the community, the local

physicians, and public officials with the need for a concerted program directed toward the prevention of crippling conditions in normal children. The appeal of a crippled child is universal, and when a clinic is held in a local community and people see crippled children coming to the clinic, the impression is quite lasting, and the soil is prepared for the planting and growth of a permanent educational program in the local community.

Because of the large rural territory it is possible to hold clinics in local communities only once each year. In order that every crippled child may have access to an orthopedic examination, an attempt is made to hold the clinic in the same town yearly so that it may function as a permanent out-patient department of the State Hospital for Crippled Children. These clinics are coöperative affairs, with local, county, and state groups participating.

One must take into consideration that a crippled children's clinic is quite different from a prenatal, a preschool, a tuberculosis, or a nutritional clinic, due to the highly specialized nature of orthopedics. It is possible for an orthopedic surgeon to examine a patient quickly, determine what muscles are paralyzed, what bones are in a pathological condition, and, in the majority of cases, make a definite diagnosis and recommendation for treatment. In a clinic for crippled children one is not confronted with the difficulties of determining what may be hidden in the chest of a child who is not well, or what may be found in the abdomen of a child who is complaining of vague symptoms. It is possible in these clinics to examine new cases and determine what should be done, and to follow up old cases almost as effectively as can be done in the out-patient department of a hospital. In Minnesota all of the records for crippled children

in the community in which the clinic is being held are brought to the clinic so that an accurate follow-up can be accomplished. One of the orthopedic surgeons in attendance at the field clinic is on the staff of the State Hospital for Crippled Children so that the same standard of medical care is maintained in the clinic as exists in the out-patient department of the hospital.

The functions of the clinic are multi-fold, and include all of the preventive aspects of good public health practice. By means of these clinics it is possible to reach previously unknown crippled children for an examination soon after the occurrence of their disability. Many families living 200 or 300 miles from the urban treatment centers are unable to provide transportation to bring their children to the hospital for examination. By sending the examiners out to the children in rural areas much time is saved, examinations are made at an earlier date, and definite provision can be made for hospital care if the patients are unable to provide private medical care. New cases are discovered and treatments are started soon after occurrence of disability, and as a result these patients are given medical and surgical treatment in the shortest possible period of hospitalization.

In addition to the clinic service of examination of new cases, there is the equally important work of follow-up. It is true, in most instances, that children will come to the hospitals for crippled children to receive medical and surgical care, which may require several months of hospitalization. Not infrequently, however, crippled children come to the state hospital for surgical and other corrective treatment, go home and do not return. The result is that the initial expert work is very often of small benefit due to the fact that additional treatment needed cannot be given.

A study made by the new medical

social service worker at the State Hospital for Crippled Children on 1,070 patients registered at the hospital showed that 140 patients who needed to return had been seen last 10 to 15 years previously, and that 215 additional patients who should have returned 1 to 5 years after their initial treatment had not returned at the time of the study. This means that the combined efforts of the field nursing and clinic services in coöperation with the hospital social service would be needed to prevent permanent disability and possible further deformity in 33 per cent of the 1,070 crippled children who had come to the hospital for care. Funds for any social service or field service at the state hospital were not available during the period studied.

The clinic serves as a valuable means for education of the people in the community to the need for early care of crippled children and for the prevention of crippling in normal children. The public interest aroused by the clinic, and the effect of the examinations on the parents of the crippled children and visitors, are of definite advantage in creating consciousness of the crippled children problem. In addition to the education of the lay persons in the community, the clinics have been of value to the local physicians too. Local physicians have attended every clinic which has been held, and invariably one or two physicians have stayed all day in order to observe the examination of each crippled child and to discuss orthopedic care with the orthopedic surgeon.

During the past fiscal year 12 field clinics for crippled children have been held in rural Minnesota. These clinics were strategically placed so that every crippled child wishing to go to a clinic had access to it in his own or in a neighboring county. In these clinics, 1,059 crippled children were examined. Of these, 372, or 35 per cent, were new

cases to the central registry of the State Board of Control. The majority of the new cases were referred to the clinics by field nurses. During the year the average number of crippled children admitted and examined per clinic was 88.

The age distributions of the new cases admitted to the clinics are of interest. The percentage of age distributions for those under 1 year is 4.9; 1 to 4 years, 22.8; 5 to 9 years, 24.4; 10 to 14 years, 22.8; 15 to 19 years, 23.6; 20 years, 1.6. There is a definite increase in the age group under 1 year of age in the clinic group as compared with all cases on the registry, a marked increase in the age group 1 to 4 years, and a decrease in the older age group in the new clinic cases as compared with the total group. There are many variable factors unaccounted for in this comparison, but it is strikingly evident that the clinics are bringing in for examination and treatment a large number of young children.

In 25 per cent of the total clinic cases hospitalization was recommended. When children for whom hospitalization had been recommended and approved did not come to the hospital, the field nursing staff went into the homes to investigate the cause of the delay. In addition, arrangements were made for another 28 per cent of the total number of children examined at the clinic to be taken care of in one of the out-patient departments of the hospitals for crippled children. Some of these cases were to be reexamined in future field clinics near the children's homes. When necessary, transportation from the home to the treatment center was provided by one of the local service clubs or by railroad companies. About 15 per cent of the total number of children were referred to the nursing service direct for supervision. This includes those cases which could give physiotherapy instruction

in their homes by the field physiotherapy nurses. The remaining 32 per cent of the cases either needed no special treatment or other local arrangements were made for their care.

The results already obtained by means of the field nursing service and field clinics warrant the assumption that these two public health procedures have been of definite value and will be of increasing value in the preventive aspects of the program.

It cannot be emphasized too strongly that the family physician is an integral part of any sound public health program for crippled children. He is the person who usually sees the crippled child first, and to whom the crippled child must be returned after special medical care has been given. It is possible to find out about many new patients from the local physician and at the same time stimulate his interest in the preventive aspects of crippling conditions. He may also be encouraged to make use of state facilities for the proper orthopedic care of such of his patients as are unable to provide private medical attention.

The public health nurses have done fine preventive work in bringing to the attention of the medical profession information relative to services for crippled children. In a 12 month period, 6 public health nurses working throughout this large territory have interviewed over 900 general practitioners, have acquainted them with the services for crippled children, and have emphasized the need for prevention of crippling conditions in both normal and crippled children.

The rôle played by the orthopedic surgeon in the preservation of function and prevention of further deformities is of paramount importance and is the hub of the wheel around which all complementary and supplementary services revolve. The 3 principles outlined by Orthopedic Surgeon

Hart, which are of particular value in the prevention of deformities and disabilities, are: (1) surgery when indicated; (2) fixation in optimum position; (3) physical therapy; all of which are directed toward mechanical and physiological rest of the injured or diseased part.

The orthopedic surgeon cannot carry out his principles of medical care unless patients are made available to him, preferably soon after the occurrence of the disability, and continuously once treatment has been started. It is in this part of the preventive program that public health nursing and field clinic services are particularly effective.

The combined efforts of all these forces lead to the discovery of crippled children at an early age and soon after occurrence of crippling, and result in adequate and continuous medical treatment, with a greater opportunity for complete physical rehabilitation at a minimum cost to the state.

The need for state-wide development of sight conservation and other related projects through coöperation with agencies interested in the preventive aspects of crippling diseases, is obvious. Up to the present the crippled children program in Minnesota has been limited mainly to orthopedic crippling conditions, and the statistics quoted relate to the experience in that field. However, it is to be expected that in the future various types of crippling conditions and handicaps will be grouped to include all handicapped children under one heading. It is just as important to provide care for the child who is partially seeing or hard-of-hearing as it is for the child who is crippled because of the residual effects of anterior poliomyelitis. The preventive aspects of these other handicapping conditions are fully as important as the ones briefly mentioned in this paper, and require the application of the same public health methods described above,

if permanently beneficial results for crippled and handicapped children are to be obtained.

SUMMARY

1. Actual prevention of deformities and disabilities in the normal child is a very important part of the problem of the crippled child. Emphasis by the official state agency has been placed upon the equally important part of the program concerned with the preservation of function and the prevention of additional deformities in the child already crippled.

2. The extent and distribution of crippling conditions and some of the variable factors involved in a preventive program in a state with a population of approximately 2,500,000 people, are presented.

3. The age of occurrence of various crippling diseases and conditions is presented and shows that effort must be concentrated in the early age group, during which a large proportion of the crippling occurs.

4. Three factors have an important bearing on the preventive aspects of crippling conditions:

a. The age at which the disabilities occur
b. Accessibility and extent of hospital facilities

c. Provision for follow-up examinations of children who have had initial medical care for the correction of their crippling conditions

5. Field nursing service and field clinics seem to offer an effective and successful means of reaching and maintaining supervision over the largest number of crippled children in a state with a large rural population.

6. It is emphasized that the family physician is an integral part of any sound preventive program for crippled children, and that the orthopedic surgeon is the person most competent to provide special medical care and treatment.

7. With a knowledge of the extent and distribution of crippling conditions, provision of hospital facilities for examination and treatment of crippled children, competent field nursing service and field clinics adequate enough to find children soon after the occurrence of disability, and an educational preventive program directed toward normal children, we are prepared to attack the problem of prevention of crippling diseases in its entirety and to establish a more adequate basis for the health and welfare of under-privileged and handicapped children.

The Public Health Nurse and Orthopedic Nursing Care*

DOROTHY J. CARTER, R.N.

General Director, Community Health Association, Boston, Mass.

DOES the public health nurse have a contribution to make to the care of the crippled child and the orthopedic program? If 20 years of experience in one public health nursing organization can be used as a guide, one can say with firm conviction, "Yes."

The care of the crippled child in the Boston Community Health Association was initiated by an emergency situation—the infantile paralysis epidemic of 1916. With the large number of cases suddenly thrust upon an unprepared community and the prospect of years of intensive treatment and after-care before them, the authorities turned to the agency in the city that for years had been caring for the sick in their homes. The visiting nurse knew how to enter a home, how to establish a friendly relationship with the family, how to give individual service to the patient, how to teach the family and help them to adjust to illness. What she did not have in this instance was the specific training in physical therapy needed for the follow-up treatment of poliomyelitis. This she could acquire, however, and a few nurses who had been on the staff for a number of years were given this special preparation.

They returned to the staff and initiated the program of home treatment and supervision of the infantile paralysis cases. Later a plan was worked out whereby each year one or two nurses were released to take a short intensive course in physical therapy and to return to act as orthopedic nurses in their districts. Thus a small corps of specially prepared nurses was gradually built up to serve as a nucleus for the orthopedic program.

Gradually, too, the care of other orthopedic conditions was added to the service. While we usually think of the poliomyelitis work as constituting the largest part of the program, we are always surprised on taking a census to find how many other orthopedic cases are under care. On the first day of January, 1937, for instance, we had on our records 401 active cases which were receiving orthopedic nursing treatment. Of these only 210 were poliomyelitis cases; the others included fractures, arthritis, cerebral hemorrhage, obstetrical paralysis, muscular atrophy, osteomyelitis, club foot, pronated feet, torticollis, scoliosis, etc.

Just as we have gradually added these other conditions to our case load, so, over the years, the orthopedic nurses have gradually passed on to the rest of the staff an appreciation of orthopedic nursing care. At first this was largely an unconscious process, but

* Read at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

of later years has been very much a conscious one, with a definitely planned program of staff education in orthopedic conditions under the leadership of our orthopedic nursing supervisor. At present we have 10 orthopedic nurses to a staff of approximately 140 nurses, who are distributed through the various districts of the association and their activities are as follows:

1. To care for all the infantile paralysis cases in their districts.
2. To give nursing care as needed and general health supervision in those families which they are carrying for polio after-care—this may mean prenatal care to the mother, correction of defects of other children, instruction in diet, etc.
3. To carry a small district of their own for general service, similar to the other staff nurses, depending on how heavy the infantile paralysis case load is.
4. To act as consultants to the other nurses on orthopedic problems.

The general staff nurse, on the other hand, is now carrying any orthopedic case that occurs in her district with the exception of infantile paralysis. The orthopedic nursing supervisor demonstrates the treatment to the general nurse and gives her close supervision. Occasionally the general nurse has even carried an infantile paralysis case under close supervision. Thus the objective has been to make it a truly generalized program.

The orthopedic nursing supervisor directs the educational program in orthopedic care, supervises both the orthopedic nurses and the general staff nurses, and acts as a liaison between our agency and the various orthopedic clinics which refer cases to us.

Let me give you one or two examples of the cases that we have carried. Johnny Harris was only 11 months old, one of twin boys, when he was stricken with infantile paralysis, which left him completely paralyzed in both arms and legs and in the respiratory muscles. His father died suddenly of

pneumonia several months later, leaving Mrs. Harris with the two children to care for and support, one of them a helpless paralyzed baby. For 5 years our orthopedic nurse visited that home, giving intensive massage and exercise to Johnny, seeing that he was taken back to clinic periodically, watching one by one some of the more important muscles being restored, helping to keep up his mother's courage and morale as she struggled to keep the family going. Last year we were rewarded by seeing Johnny, aged 6, start at the crippled children's school, wearing braces, it is true, but with every expectation of taking his place with other children his age.

It would have been exceedingly difficult if not impossible for Mrs. Harris to take this boy to clinic regularly for treatment or to continue to give the treatment herself unaided over such a long period of time. Even in those families where the mother or father is giving intelligent and faithful treatment, we have found with 20 years of experience that the orthopedic nurse is very much needed, not so much sometimes because of the actual treatment that she gives, but because her regular visits bring encouragement and stimulation to the parents as well as to the patient, and give them the necessary impetus to carry on. I verily believe that the nurse who becomes over the years a staunch friend of the family, gives as much in hope and morale as she does in actual care and treatment.

The results that can be obtained through intensive and long-time treatment in poliomyelitis cases are so striking and well known that perhaps they do not need to be emphasized here. I do want to emphasize that the orthopedic nurse can be an important agent in giving this treatment. Not only in the follow-up care but also in the acute stage, if she can give nursing

care during that period, she can assist in preventing crippling conditions.

Less dramatic, perhaps, but just as telling is the contribution that the public health nurse can make in the care of other orthopedic conditions. There is the case of John Bailey, for instance, a husky truck driver of 35 years, who spent several months in the hospital with a badly infected hand and arm that had to be incised again and again. When he was finally discharged he was told he would never be able to use his right hand again, so badly had it become distorted and crippled. As a last resort he was referred to us for massage. The nurse worked for 3 months on the crippled arm, and again we were rewarded by seeing him return to his job with enough function to continue as a truck driver. This is an example of the kind of thing that a general staff nurse, without special training in physical therapy, can be taught to do.

Time and again when the doctor has about given up hope of restoring function in a crippled arm or leg, the nurse has kept on with the treatment and has been rewarded with partial recovery. Often, too, such recovery has meant obviating the need for an operation and other expensive treatment. Too often in the past in cases of fracture or hemiplegia in elderly or middle-aged people, have we accepted the condition as inevitable and they have become an accepted burden on the family and community. Now we are learning that often with skilled and prolonged treatment they can be partially restored as functioning individuals, and their pleasure and satisfaction therein cannot be over-estimated, let alone the saving to the family and community.

Orthopedic nursing care, important as that is, is only a part of the service that the public health nurse renders. By virtue of her preparation as a public health nurse, she can make a greater

contribution. The orthopedic patient is not *per se* any different from any other with a specific diagnosis—he is still a member of a family and of a community, and is considered as such by the public health nurse, whose service is based on the fundamental principle of the family as a unit in health teaching. Again and again we find that in addition to specific orthopedic treatment there is urgent need for guidance in matters of diet and general hygiene, not to mention in the field of mental health. Many times it is discovered, too, that the orthopedic condition cannot be relieved until some other situation has been remedied. The public health nurse because of her intimate knowledge of the family and home is in a strategic position not only to ascertain the sum total of situations which enter into the family's way of living, all of which directly affect the recovery and well-being of the patient, but also to report these to the physician in charge of the case and to assist in their adjustment, whether it be through her own services or those of another worker or agency.

There was Mrs. Lewis, for instance, 64 years old and crippled with arthritis, who was referred to us for baking and massage. On our first visit we found that she was trying to get along on what was practically a starvation diet, that she badly needed dental care, and that although she wore glasses she could see very poorly as her eyes had not been reexamined for 10 years. After many weeks and with the aid of various agencies and groups, new glasses were obtained, a set of teeth was provided, her income was supplemented to provide the necessities, and our nutrition worker aided her in working out a budget and adequate diet. While referred to us primarily for orthopedic care, it was only when these other conditions were adjusted that she began to show improvement.

Perhaps because we are fortunate enough in the Boston Community Health Association to have a nutrition service we have often found that it has helped to win the battle in many of these cases. Whether it was a 42 year old man partially paralyzed from poliomyelitis, who had to have a daily cathartic and enema until the nutritionist worked out a laxative diet for him; or the Haynes family with 4 children under 6, one of whom—3 year old Bobby—was so badly rachitic that he had to have his bowed legs broken and reset; the need for nutrition advice is of vital necessity if permanent improvement is to be expected. In fact, so imbued with the importance of adequate diet was 6 year old Johnny Harris, mentioned above, that when he was served one day with a hot dog at lunch at the crippled children's school, he refused to eat it, saying seriously that he didn't think hot dogs were very good for him! Needless to say, we do not always get such a response from our children!

If nutrition teaching is found to be an essential part of our service, equally so is the need for mental hygiene. The public health nurse, because of her association with the family over a long period of time, can give invaluable aid in helping both the patient and the family with the right approach to the patient's condition. Perhaps more effective than any direct teaching that she does in this field is the indirect value to the family of observing in visit after visit the nurse's own attitude toward the patient; her manner of talking to him; of giving understanding and encouragement without too much sympathy; of expecting him to make an effort in his own behalf and fulfil his part in making improvement, in securing an education and vocational training. I have been impressed in visiting orthopedic cases with our nurses by seeing the skill with which

they approach the patient and his individual problems, and how unconsciously, perhaps, over their years of experience they have learned to demonstrate a sane approach to the crippled individual.

While we have considered up to this time the part that the public health nurse plays in the care of the orthopedic patient, equally important is her contribution to the program of case finding and prevention. Let me cite a few examples.

One of our nurses—not an orthopedic nurse—had been giving care to a 9 year old colored girl with acute pharyngitis. On her last visit, when the girl was up and around, the nurse noticed that she walked with a slight limp. The mother was persuaded to take the child to the clinic, where she was found to have a congenital dislocation of the hip. Arrangements for an operation were made immediately and the condition which had been neglected for 9 years was taken care of.

In another instance a nurse was giving postpartum care to a mother and noticed that one of the children walked with a limp. It was found to be an old poliomyelitis case that had gone unrecognized.

An alert public school teacher was responsible for discovering another case of old poliomyelitis. It happened that she had two crippled children in her class who were under our care, and through them had learned something of the treatment. She spoke to the nurse about another boy who limped slightly, and he, too, was found to be an old poliomyelitis case and was placed under care.

The maternity service offers an unusual opportunity for preventive work as our nurses have been taught by the orthopedic supervisor, as they examine and bathe the new baby, to be especially alert to any suspicion of congenital defect, which occasionally, in the rush

of both hospital and home delivery, goes unnoticed.

To make a corps of nurses "orthopedic conscious" is neither an easy nor a quick task. It is a slow process of education and continuous "exposure" to orthopedic work and the orthopedic worker. Yet when it is accomplished, the results are so worth while and often so startling that we have never regretted the time and effort that have been put into it. We have seen new staff nurses and even supervisors who are skeptical of what can be accomplished until they work with a patient themselves, with the guidance and help of the orthopedic supervisor, and see the results. Then they are sold to it forever after.

It seems to us essential that there should be one specially trained orthopedic nurse—or for a large staff, a small corps of orthopedic nurses—to serve as a nucleus for the program. It seems to us equally essential that a conscious effort and plan be made to have that nucleus radiate through the entire staff and service. This must be done if the public health nurse is to play her most important part as an instrumental factor in the case finding and preventive program.

I do not need to emphasize how important is the relationship and tie-up of the orthopedic nurse to the other agents in the orthopedic program. The care and education of the orthopedic case of necessity involve continuous and close team work between many workers and groups, physician and clinic, physical therapy technician and public health nurse, social worker and teacher, vocational school and employer—a life cycle of coöperative endeavor and a true challenge to any community service. The public health nurse's contribution to this scheme is insignificant indeed unless she sees herself as a part of this larger program and fits in her own service accordingly. She must

know what are the potentialities and facilities for creating a useful citizen and is often the first person to turn the family's attention to a wider horizon of development and usefulness.

How shall we prepare our public health nurses for this work? By necessity we have done it in our own organization more or less, as you can see, by the fortuitous method. For those who were to serve as the nucleus of the service, the special orthopedic nurses, we have built on the foundation of their public health nursing preparation and experience and added to it intensive training in physical therapy. They have then worked on the staff under the close and continuous supervision of our orthopedic nursing supervisor. For the general staff nurse—and again I want to emphasize that her preparation for this service is fully as important as that of the special orthopedic nurse—we have again built on her public health nursing preparation, and by a planned staff educational program, the opportunity to carry orthopedic cases under supervision, and continuous exposure to orthopedic work, have gradually built up a staff of generalized nurses, not only able to carry general orthopedic cases under supervision but a staff that is "orthopedic conscious" and, we feel pretty sure, one that is making a definite contribution to the case finding and preventive program.

This is the orthopedic nursing program of one agency that already had a well established public health nursing program. How far this same program can be developed in rural areas and on a state-wide basis is another question. And yet the general principles, it seems to me, remain the same—a well prepared body of public health nurses, a group of orthopedic nurses to serve as a nucleus and act in a supervisory and consultant capacity, and a continuous staff education program. It

sounds simple, but, as many in this audience know, is far from simple in practical application. It is something that we shall have to experiment with. It has taken our organization many years to develop the program to the place where it is today, so you can see what lies ahead. There are many questions involved. Do we need more orthopedic nurses or physical therapy technicians, or both? Where does the work of one leave off and the other begin? Each has a definite contribution to make.

Again, what is the best way to prepare orthopedic nurses? I am not sure that we yet know—here, too, we shall need to experiment, and here, too, there are many questions involved. How much physical therapy does the orthopedic nurse need? Does she need to be a public health nurse-physical therapist, implying complete preparation in both fields, or is the emphasis to be on orthopedic nursing, in which her major contribution and skills are to be in her own field of public health nursing with enough preparation in physical therapy added to enable her to carry on and supervise in the home—which is her especial province—the intensive treatment that is needed. I think that if we can keep in mind the inherent contribution that each of these two groups of workers has to make—the physical therapy technician as the specialist par excellence in the hospital and in the clinic, the orthopedic nurse as the generalized health worker in the home—that it will help. And if—more important still—we can keep uppermost in our minds, the needs of the patient and the most efficient and most eco-

nomical way of meeting those needs, it will be more helpful still. What does the infantile paralysis patient, the general orthopedic case, need in the way of special treatment, general care and supervision, education? What kind of a worker, or workers, can best and least expensively meet that need? How shall this worker be prepared to give this needed service? The answers to these questions may mean that adjustments will have to be made by all groups, adjustments both in service and in preparation, but these we should be glad to make for the ultimate good of the patient.

In summing up, while there are still many questions to be answered and there is need for experimentation and further development, certain facts can be stated:

1. The experience of a number of communities, for the most part in urban centers, has demonstrated that the public health nurse has a definite contribution to make to the orthopedic program.

2. The public health nurse with special preparation in physical therapy can be an instrumental factor in the care of poliomyelitis cases, both in the acute stage and in the long period of follow-up treatment. The fact that she is a public health nurse and a family health worker makes her contribution in this respect particularly significant.

3. The public health nurse without special preparation in physical therapy can be taught to take care of general orthopedic conditions with the guidance of a special orthopedic nursing supervisor.

4. Public health nurses can be made "orthopedic conscious" through a program of staff education and continuous exposure to orthopedic work and orthopedic workers.

5. The public health nurse, because of her strategic position as a family health worker, can make her biggest contribution in the case finding and preventive program.

Social Work and the Physically Handicapped Child in the Development of a New State Program*

DOROTHY BUCKNER

Consultant, Medical Social Work, Bureau of Health, Augusta, Me.

IN the development of a new state program for services to physically handicapped children, in a state which is largely rural, and in which there previously have been no services on a state-wide basis, the problem which faces the medical social worker is that of developing effective methods for carrying out the type of medical social services which in the past have been available mainly to children in urban centers.

The methods used in setting up and carrying out an effective program will, of necessity, vary in different states because of the individual state setups, but they will essentially be somewhat similar and should be useful for comparison. It is because of this that it may be of interest to describe the preparation which was necessary before a program of services could be set up in Maine; the methods which have been used; how well they are functioning; and, at the present time, what the limitations are in the way of carrying out a complete program.

There were three vital needs which had to be met before the program could be set up. It was essential:

(1) that the medical social worker should know, correlate, and be able to utilize the resources throughout the state; (2) that there should be established a close working relation between the State Bureau of Social Welfare and the State Bureau of Health (the Extension of Child Welfare Services being in the Bureau of Social Welfare; and the Nursing Division and Services to Crippled Children coming under the Bureau of Health); (3) that the purposes of the Crippled Children's Program and the Extension of the Child Welfare Services, which are inter-related and dependent upon each other, should be carefully interpreted and understood by the community as a whole.

With these needs in mind the medical social worker, together with the Supervisor of Child Welfare Services contacted social agencies and nursing groups, both public and private, as well as the individual nurses and social workers in the field. In addition, the medical social worker spent a considerable amount of time contacting medical, social, educational, vocational, and lay organizations, service clubs, and key persons throughout the state in an effort to elicit their interest and coöperation in locating crippled children and in the program in general.

The time spent in this preliminary

* Read at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

work led to a good deal of coöperation and actual participation of these groups in the program, and it acquainted the medical social worker both with the resources which were available in the state and those which were lacking and would need to be developed.

It was learned that there was a scarcity of social, educational, and recreational resources, and that it would be easier to plan for the crippled child's medical care than it would be for his educational, vocational, and social needs.

Private social agencies were found to be located mostly in urban centers and their services to be available only for clients in those centers. There were no convalescent homes, and no facilities for mental hygiene work. Although occupational therapy and physiotherapy was available in all the hospitals which would be used for treatment of crippled children, only one hospital employed a medical social worker. Teaching facilities were inadequate, in that they were available in only one hospital, where provision was made for only 10 or 15 minutes a day instruction to each child in elementary grade work. There was but one special class for crippled children in the state, and this, although held in a public school building, was supported privately. There were no provisions for teaching children in convalescent, boarding, or their own homes, except in Portland where one teacher was available for this purpose. Tuition for vocational training could be obtained for crippled children through the Rehabilitation Division of the Department of Education, but there were no funds to pay for the cost of board and room during the training period.

The Pine Tree Society for Crippled Children, a branch of the International Society for Crippled Children, had been established in the state but had never actually functioned.

It was apparent that, in a state which is 65 per cent rural, one of the difficulties in getting children to clinics and hospitals would be arranging for transportation, and that private resources for this purpose would have to be developed before clinics could be held.

Prior to the extension of child welfare services the case work of the Bureau of Social Welfare was limited to the care of Mother's Aid Families and the supervision of Neglected and Delinquent Children committed to the bureau for care and protection. Because of the limitations of the type of social services offered by the Bureau of Social Welfare to the Bureau of Health, a close relationship had not existed between the bureaus, even though both were within the Department of Health and Welfare. With the development of new Child Welfare Services, which were to be of a preventive nature, case work of the service type would be available and there would be provision for the supervision of boarding homes for crippled children.

The services of public health nurses, either employed by the state or local and private agencies, could be used throughout the state, and it would be possible to arrange for physiotherapy for patients placed in boarding homes, and in some instances in their own homes.

Clinics could be held regularly in 3 hospitals located in the largest communities and in rural areas when traveling conditions permitted. The clinics would be available to patients regardless of their financial status, the only stipulation being that the permission of the family physician must be obtained. Hospitalization for patients could be obtained at 4 private hospitals.

The determination of the patient's ability to pay in part or in full, for surgery, hospitalization, appliances, etc., could be made by the medical social worker and only those who were found

to be financially unable to pay would receive treatment free of charge. A fund for appliances, X-rays, physiotherapy, and convalescent care, would be available for use through the Bureau of Health, and a Hospital Aid Fund through the Bureau of Social Welfare for patients who had not received aid from the town or State Division of Aid and Relief within 3 months. Arrangements would have to be made with towns and the Division of Aid and Relief for the cost of treatment for patients under their care.

In order to arrange for transportation before the first clinics were held, the medical social worker met 3 area chairmen of the Pine Tree Society. These chairmen had not yet set up committees and they had no definite program plans in mind. It was agreed that active committees would be set up immediately, and that their first function would be to arrange for the transportation of children, for whom transportation facilities were not available. In addition to this, arrangements for transportation were made possible through the efforts of local service groups, whose interest and participation had been aroused mainly by the local nurses and social workers.

It was necessary to establish several working relationships in order to make it possible for medical and medical social recommendations to be carried out rapidly, and to prevent the unnecessary transportation of patients.

Arrangements were made with the Nursing Division, the Bureau of Social Welfare, nursing organizations, and social agencies, for all patients to be seen prior to coming into the clinic, by either a nurse or social worker and a refer blank filled out and sent in, together with the family doctor's consent slip giving permission for patient to attend the clinic.

The refer blanks were to supply the following type of data: Economic

Status; Religion; Medical, School and Social History; Transportation Facilities; Verification of patient's legal settlement; and determination as to whether or not the patient's family was receiving public assistance, or had received any within 3 months.

The School and Social History, in detail, was to supply the following data: *School History*: School attended (parochial or public), location of school, distance from home, transportation, age at entrance, age when leaving school, reason. Special school or tutoring, etc., High School, vocational. Time lost due to lack of transportation, time lost during hospitalization or care at home. Mental rating. School adjustment, with teacher and other pupils. Plans for rehabilitation. *Home: Physical Set-Up*, Description of neighborhood and house, number of rooms, number of bedrooms, sleeping arrangements, location of bathroom and toilet, heat and light. Suitability of home from a physical standpoint for care of patient. *Family Relationships*: Attitudes, parents to each other, parents to patient and other children, patient to parents and other children. Suitability of the home from a psychological standpoint for care of patient. *Coöperation of patient and patient's family*: Estimate of actual or potential coöperation of patient and of patient's parents regarding medical treatment. *Social Data and Comments*: Family history and background. Type of parents. Management of patient and other children. Estimate of present economic situation of family. Recreation and special aptitudes of patient, pastimes, interests, playmates, etc. Interested agencies and individuals and why interested. The key person in the social situation, whether a member of the family, a relative, a private individual, or a member of an agency.

Authorization was obtained from the Bureau of Social Welfare for the med-

ical social worker to pass on the eligibility of patients for hospital aid, and the hospitals were notified to this effect by the Bureau of Social Welfare. It was, in addition, requested of the field workers that if the patient's family had been receiving public assistance within 3 months they should obtain authorization from the local overseer of the poor, or selectmen, for the cost of therapy, appliances, or hospitalization, which might be ordered at the clinic, to be met by or through the town.

Six months after the clinics were started the Pine Tree Society was reorganized and a new president appointed. She was one of the area chairmen, who had become greatly interested in the Crippled Children's Program, and had been responsible for a local school board taking over the financial responsibility for the one special crippled children's class in the state. She was also chairman of the legislative committee for education of the Parent-Teacher's Association, and it was hoped that it would be possible, through her, to obtain legislation which would provide for the compulsory education of crippled children in their homes. The impossibility of obtaining legislation for adequate teaching facilities for children in all of the rural schools this year, however, made this impossible. A Seal Sale was conducted by the Pine Tree Society at Easter time and it is hoped that by next year there will be funds available through this society to help in carrying out plans for the teaching of crippled children in homes, and to pay for the cost of board and room for patients whose rehabilitation plans cannot otherwise be carried out. The Services for Crippled Children is directly connected with the Pine Tree Society in that the medical social worker and the Medical Director are Directors of the Society, and the latter is also a member of the Executive Committee.

For the present time the Pine Tree Society is supplying transportation in 5 areas and within the year it is hoped that the remaining areas will be developed.

I think it can safely be said that the medical treatment and follow-up of the crippled children, under the care of the crippled children's service in Maine, is being carried out adequately. Reports of clinics and hospital recommendations are being given to the nurses and social workers in the field, and they are doing splendid work in the way of seeing that these recommendations are carried out and that patients return to clinics. The clinics have consistently grown. New cases continue to increase at a steady rate and for the most part patients return when check-ups are requested. That the value of the service is realized by rural physicians is shown by the fact that more and more cases are being referred in directly by them.

The information regarding the economic status of patient's family, which has been sent in on the refer blanks, has made it possible for the medical social worker to make financial arrangements quickly for the patient's care. Arrangements for hospitalization have been made as desired by the consulting orthopedists. This is shown by the fact that, even though over 700 cases have been seen in one year, there is no real waiting list for hospitalization. Arrangements for hospitalization have been made at the time of the clinic visit and for the most part patients have been admitted to the hospital on the same day.

It has been possible for the medical social worker to make arrangements, at the time of the clinic visit, for patients to obtain X-rays, physiotherapy, and apparatus, etc.

The school, social, and environmental information which has been obtained through the refer blanks, has made it

possible for the medical social worker to interpret the social conditions of the individual patients to the orthopedic surgeon, and together with him plan for the patient's medical social treatment. This information has also served as a basis of selection for those patients and families who would need medical-social treatment.

Medical-social services have been carried out mainly by the public health nurses and by the social workers in the Bureau of Social Welfare. Where actual case work has been needed the work had been done mainly through the Bureau of Social Welfare, due to the fact that there are so few private agencies in the state. The amount of case work services which could be supplied by these workers during the past year has been limited because the plan for Child Welfare Services was in the process of development. At present the social workers in the Bureau of Social Welfare are serving as actual field staff for the medical social worker.

I think it is important to point out

that, if the development of Child Welfare Services within the Bureau of Social Welfare had not been provided along with the development of Services to Crippled Children within the Bureau of Health, it would be impossible for the latter to provide case work treatment for the patients under care.

The main limitations to the carrying out of a complete program of medical social services at the present time are: (1) the inability to arrange adequately for the education of crippled children during hospitalization and convalescence, as well as for those children who cannot attend school because of their disabilities; (2) the lack of funds to meet the cost of board and room for the children who for this reason will not be able to have vocational training; (3) the impossibility of supplying sufficient intensive medical social treatment for patients who may need help in making satisfying social adjustments. Medical-social workers are needed in the hospitals and in the field to supply skilled services before this last need can be met.

Acquired Tuberculosis in the Primate in Laboratories and Zoölogical Collections*

C. R. SCHROEDER, D.V.M.

*Veterinary Pathologist, New York Zoölogical Society,
New York, N. Y.*

TUBERCULOSIS has been a recognized major problem wherever primates have been kept for as many years as the organism *Mycobacterium tuberculosis* has been recognized in domestic animals and man.^{1, 2} The gross and histologic picture of primate tuberculous pathology in its various forms has been well described^{1, 2, 3} and compared with lesions in man both in this country and abroad. This order of mammals has not had the opportunity to build up a genetic resistance, inasmuch as the monkey does not usually encounter the disease in his native habitat.⁴ The majority feel that there is small likelihood of active tuberculosis existing in the primate in his native forest. Before a monkey could become an open case and disseminate virulent organisms, his natural enemies would have destroyed him. There is always the possibility of making contact with organisms in and adjacent to native villages while feeding on refuse. The high incidence of tuberculosis in man in and near the habitats of primates suggests a source of infection by contact after capture. Tuberculosis

mortality statistics from the League of Nations report for 1932 shows 307 deaths per 100,000 in Singapore and 613 in Manila; 294 in Panama, and 554 in Guayaquil as compared to 69 in New York and 55 for the United States as a whole. The number of primates born in captivity, which might eventually build a more resistant strain, is extremely small. Because of this lack of selective mortality, susceptibles continue to be placed in human communities where they make direct contact with frequent large doses of virulent *My. tuberculosis*, an organism to which they and succeeding generations have or will have little or no resistance.⁵

According to dealer reports, the traffic in primates is increasing. Laboratories are using greater numbers for the investigation of virus diseases; for physiological, psychological, bacteriological, anatomical studies, and experimental surgery. New zoölogical gardens, the construction of which was made possible by the Works Progress Administration, are making their appearance, some operated by city governments and others by zoölogical societies. Parks and laboratories have both made a very definite advance in the improvement of primate hygiene. The dealer on the other hand has not made

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

any marked change in his method of importing or holding primates for sale. If the animal is to be kept as a permanent exhibit and is expected to live through or exceed a normal life span, special precautions should be taken to prevent contact with large or frequent doses of *M. tuberculosis*. Usually the preventive program is weak. Shipping crate sanitation is notoriously bad. The type of construction, overcrowding, and neglect in transit is inexcusable. Paddy rice is not a satisfactory diet for a 30 day journey, and certainly not acceptable when thrown into a crate contaminated with tuberculous stools or dead specimens. Indian, Philippine, and like crews are an excellent source of virulent tubercle bacilli. Expecterating into the monkey shipping crate is almost a routine with them and the incidence of tuberculosis in this group is high. Monkeys may or may not be transferred or redistributed in new crates after receipt by the dealer. Usually the original crate continues to the monkey's destination—the laboratory, zoölogical garden, or circus. The method of shipping is as old as the business itself.

A tuberculosis-free collection must be protected from contact with new importations which may disseminate virulent organisms shortly after their arrival. Some form of diagnostic test should be used for the detection of tuberculosis and must be routinely used to eliminate those primates which may develop the disease during their period of exhibit. To understand fully the problem and to accumulate definite statistics, we prepared a questionnaire with portions acceptable to the varied groups which take part in primate traffic. It was sent to those institutions which we felt had the broadest experience. The average findings in the returned questionnaires indicate that the Bengal monkey, *Macaca mulatta*, decidedly exceeds all others in

number of importations, and is the most popular laboratory animal.

The poor response to our questionnaire, and incomplete reports, indicate that little is being done to curb the rising incidence of infection.

The incidence of primate tuberculosis including all forms is about 10 per cent annually. Of all primates that die 80 per cent are attributed to tuberculosis. One laboratory states that they can demonstrate tuberculous lesions, often latent, in every monkey destroyed over a period of years—325 specimens. The primate incidence of 10,000 per 100,000 mortality is exceedingly high as compared with the national rate of 55 per 100,000 in human beings in the United States. However, in the report by Whitney & McCaffrey,⁶ using Purified Protein Derivative in group testing in the United States, they find 47.0 per cent reactors in the all-age group, and 60.1 per cent reactors in the over 20 years group. The American Indian had the highest incidence, 72.4 per cent, the Negro second highest, 43.3 per cent.

Possibly man's allergic response is an indication of his immunity. The primate has some tissue reaction following acute infection but not enough to excite a typical allergic response of sufficient degree to be able satisfactorily and routinely to produce a tuberculous reaction. The Mantoux, Von Pirquet, Calmette, and intrapalpebral tests all give unsatisfactory results. The high susceptibility and poor or completely lacking allergic reaction in the primate suggests a relationship between immunity and allergy. Occasionally a typical reaction is seen which probably is a demonstration of temporary individual resistance. As the disease progresses dermal reaction to tuberculin diminishes. The reaction of most primates to tuberculin is similar to the reaction of man in the terminal stages of acute miliary tuberculosis.

In a group of 25 rhesus tested by me, we found 2 reactors in Mantoux and intrapalpebral tests. On the basis of experience with shipments from the same dealer, and postmortem findings, we should have had 50 per cent reactors.

Possibly a satisfactory test will be devised, which should have the following qualifications:

1. Ease of administration and interpretation (not requiring special technicians)
2. Requiring the use of a readily available tuberculin of standard manufacture
3. Requiring a minimum of animal restraint
4. Giving regular and satisfactory reactions
5. The test should be applicable to all primates so that it could become standard.

Complement-fixation has been suggested, but the routine collection of a satisfactory serum sample from all primates would be extremely hazardous. The Mantoux test is difficult to apply because of extremely thin vascular skin. We have found the belly the best field to be shaved. Here skin can be picked up between thumb and finger and with care an intradermal injection can be made using a 28 gauge needle. The point of injection can be outlined with mercurochrome. The reaction, should it occur, can be definitely measured. The Von Pirquet test can be applied at the same site, using two types of tuberculin and plain broth. The scarified areas here also may be marked with mercurochrome and numbered. The intrapalpebral test is easily given, using the 1 c.c. tuberculin syringe and 28 gauge needle. The monkey is held on his back, arms behind him, legs extended. The lower eyelid is picked up with the needle point bevel up, the needle inserted and tuberculin injected to leave a lentil-sized raised area. The Calmette ophthalmic test is of course the most simple to give, and some report satisfactory results.⁷ We have not had

routinely satisfactory reactions with any of the described tests. We have used bovine type K.O.T. (synthetic media), 0.25 gm. per c.c.; human type tuberculin K.O.T., and also the dilution "C," 0.1 mg. per 0.1 c.c.; human tubercle bacillus protein MA-100, 0.01 mg. of protein per 1.0 c.c.; and Purified Protein Derivative (P.P.D.), using the human first strength dose of 0.1 c.c. containing 0.00002 mg. P.P.D.; and 0.1 c.c. containing 0.005 mg. P.P.D. second strength; and also double strength using 0.01 mg.⁶ Even the concentrated tuberculins failed to produce a reaction in known tuberculous monkeys. The subcutaneous test depending on a systemic thermal response, applied to primates by Penrose, White, Brown, and Pearson of the Philadelphia Zoological Society,⁸ is successfully used in the hands of Fox and Ratcliffe of the⁹ same institution. The objection to it lies primarily in the long continued restraint necessary to establish the peak 3 P.M. rectal temperature and subsequent temperature reactions following the subcutaneous administration of tuberculin. The weight curve represents an important diagnostic criterion in all acute forms but it loses its value in the young growing monkey. Roentgenographs have real value but involve too great expense for routine tests. Some laboratories rely almost entirely on the relationship of weight curve to chest picture for a diagnosis. Probably 80 per cent of *My. tuberculosis* infection in primates is acquired between the time of capture and eventual delivery. A program of control which would aim first at importations should be instituted with federal control. Such a measure, however, would be entirely impractical until a satisfactory diagnostic test is devised. Sputum, if it can be secured, and stool concentrations are interesting sources of tubercle bacilli but routine dependence on these is not practical. Some primatologists

feel that they can identify the tuberculous animal by its appearance. In the course of its investigations a tropical laboratory destroyed 539 monkeys at large in the forest and never demonstrated a tuberculous lesion; however, the species investigated has a high incidence in its own captive group.

The order Primates should be an ideal source of study of tuberculosis from the epidemiologist's point of view. Contacts can usually be traced. It does not usually develop active immunity and presumably it comes from a tuberculosis-free community. The disease is usually epidemic during shipment and early handling and only becomes endemic where control measures are in force. The Philadelphia Zoological Society has proved that it is possible to maintain a tuberculosis-free collection where the disease had peak 20 years ago. It is understood that to establish tuberculosis in the primate as in man, large or repeat doses of virulent organisms are necessary to bring about an active infection, but when the disease becomes established in the primate its prospect of developing a passive congestion with resulting fibrosis and calcification is quite remote. If it had no resistance at all we might expect 100 per cent mortality, for certainly every primate in captivity has ample opportunity to contact small doses of *My. tuberculosis*. Old World monkeys are most susceptible; however, acute epidemics are possible in New World species. A tropical research institution experienced a tuberculous epidemic in its Spider monkey (*Ateles ater*) colony. All were destroyed and the colony reestablished. The contact here was a known open case in the human attendant. There is apparently a zoölogical family and genus variation to resistance; however, the degree of susceptibility and sub-

sequent active infection is dependent on the extent and degree of contact.

Unfortunately, all primates do not have a postmortem examination. The group that do are usually those valuable specimens in zoölogical gardens or the experimental monkeys in the laboratory that require an accurate postmortem report to complete the experiment. Some laboratories make a detailed report but seldom include a case history. A number fortunately do conduct a satisfactory examination and give pointed information, usually of a comparative nature, which should lend further impetus to the epidemiological investigation of human tuberculosis.

Deaths in young monkeys are usually found to be the acute miliary form and generalized, with outstanding pulmonary lesions. The older primate may have more extensive lesions with pulmonary caseation and cavitation, and caseous lesions in spleen, lymph nodes, and liver. We do not often see meningitis or bone involvement and serositis. Pott's disease is occasionally seen and recently we demonstrated a tuberculous serositis in a *Hamadryas* baboon (*Papio hamadryas*). Another of the same species had an acute tuberculous meningitis. A performing chimpanzee, 5 years old, had a tuberculous meningitis with cerebellar infiltration. Tuberculous pneumonias are common, especially in the anthropoid apes. It is decidedly uncommon to have fibrosis with calcification. Scrofula is occasionally seen. In all probability the older primate has developed some resistance and consequently the organism produces larger and more extensive lesions than in the young. Routinely, sections should be cut from suspected tissue, especially lung. Much gross atypical tissue proves to be tuberculous. Most laboratories routinely make a gross observation and attempt to demonstrate acid fast organisms.

Where guinea pigs have been injected and tissue concentrates cultured, the human type of bacillus has usually been found.

To assure a good source of tuberculosis-free primates for zoölogical gardens and laboratories, we recommend that the local dealer be advised of the necessity of improving the primate hygiene immediately after capture. The monkey must avoid contact with human open cases and be held in smaller groups than is the custom (maximum: 10 in a cage). Where possible the shipping crates and holding cages should have some form of open mesh floor to prevent contact with tuberculous stools. A satisfactory disinfectant should be used routinely. All sick and suspected open cases of tuberculosis are to be isolated or destroyed. The use of a diagnostic test is not recommended at this stage, inasmuch as the most reliable subcutaneous test, with thermal reactions, could not be conducted practically.

The experienced animal dealer and keeper recognizes a sick monkey—if not tuberculosis—and it is our belief that those monkeys which are disseminating organisms will demonstrate either respiratory symptoms, draining scrofula, or diarrhea. These monkeys should be destroyed or isolated. It is most difficult on shipboard to remove one or more dead or sick specimens from a small crate, 2 by 3 feet, with 30 to 50 young *M. mulatta* active and alert awaiting an opportunity to leap out. Monkeys enjoy and need their mutual warmth but they will have a greater survival rate if they are given more room. The shock of capture, crating, holding, and eventual shipping to a new life zone can most satisfactorily be cared for by giving best possible food with the necessary vitamin supplements. The time consumed in transport should not be considered as part of quarantine because it is not a

tuberculous quarantine at all, but a period of likely exposure. When the shipment arrives at the port of destination a further physical stress is experienced in the transfer from ship to dealer's quarters or to train for final destination.

Holding quarters in metropolitan areas are poor. There is a general lack of sanitation. The lack of satisfactory disinfection is often due to improper claims by the manufacturer or his representative. The efficiency of their product is usually determined by its ability to replace an obnoxious odor with a pleasant one. The standard 4 per cent solution of liquor cresolis comp. U.S.P. used hot makes an efficient cleanser and disinfectant. Coal tar derivatives are well tolerated by primates. Often an odorless disinfectant is desired and according to the U. S. Department of Agriculture, *Circular Letter 1750*, B.T.B. (Sodium orthophenolphenate) used in a hot aqueous solution, 2 per cent by weight, is quite satisfactory for the specific destruction of *My. tuberculosis*. If unpainted stainless steel or galvanized metal is used in cage construction, lye 1:200 is quite satisfactory. Concrete makes cheap permanent construction but is too damp, cold and uncomfortable for monkeys. Paraffin-saturated wood, rubber compositions, cork block, or especially compounded materials are used with success. The most satisfactory floor from a sanitary standpoint is the electric weld 12-14 gauge wire with $\frac{3}{4}$ " squares for small monkeys, $1\frac{1}{4}$ "- $1\frac{1}{2}$ " for larger animals. In permanent buildings structural glass or smooth finished plaster walls and ceiling are recommended. Sheet metal is best for the temporary or portable cage. It is also important to avoid contact between the primate and the visitor in the zoo. The most effective method is to erect a full glass partition between them. This method prevents the pas-

sage of various upper respiratory infections to the monkey from man, in addition to preventing the carriage of pathogens on food from visitor to exhibit.

We can approximate the number of primates sold annually from the estimated and actual sales figures of the Eastern dealers; *Macacus* sp. 25,000 (*rhesus* and sp.); anthropoids 250; all others 10,000. The incidence of tuberculosis is likewise a relative figure, probably exceeding 50 per cent, including latent forms, and 5 per cent open cases. There are major inaccuracies in our submitted figures. We know that the majority of *M. mulatta* originate from the same dealers, and we do not believe it possible to have 95 per cent tuberculosis infection with approximately 30 per cent acute phthisis in one group and a negative report from another—all monkeys originating from the same dealer. The incidence of tuberculosis is apparently directly proportional to the accessibility of a competent pathologist. We do not propose to state that all primates die as a result of *My. tuberculosis* infection. Trauma with or without septicemia, common cold, and bacillary dysentery cause many deaths.

Let us critically review the experience of typical buyers. A zoological society received 200 *M. mulatta* to populate a monkey island. Ten days after receipt they experienced 10 per cent mortality. During the course of the summer 125 monkeys died. All deaths were attributed to acute tuberculosis on pathological diagnosis by a competent pathologist. A physician who purchased 40 *M. mulatta* for experimental surgery had a 50 per cent loss attributed to tuberculosis before his experiment was complete. A city laboratory lost 30 per cent of a group during the course of titrating poliomyelitis pooled sera. A state institution found 98 per cent tuberculous

lesions in all *M. mulatta* that died or were destroyed, with a major incidence of active infection. The dealer is, usually, not knowingly, a party to the sale of animals with infectious disease. He is sincere in his belief that he is selling a normal specimen.

The zoological garden's aim is longevity. Consequently because of a long quarantine, attempted early tuberculosis diagnosis, a definite sanitary program, and best possible nutrition, it usually has a lower incidence of infection than the experimental laboratory.

SUMMARY

Primate tuberculosis and its pathological forms have been a major problem as long as *My. tuberculosis* has been recognized. It has become both an economic and public health problem. Its incidence has not decreased, because of lack of genetic resistance and poor hygiene. The 10,000 per 100,000 mortality rate is 200 times that of man. The human type of organism is usually demonstrated. There is family and genus resistance variability but no measured resistance within a species. Antemortem recognition of the disease in the order of popular application consists in

1. Physical examination
2. Weight curve
3. Subcutaneous tuberculin test with thermal reaction. Mantoux and related tests are not routinely successful. (The primate has an indifferent allergic response to tuberculin.)
4. Roentgenography (usually in combination with weight curve)

Postmortem diagnosis consists routinely in demonstrating an acid fast organism (usually primary Ziehl-Neelson stained smear, occasionally animal inoculation or culture with subsequent smear) from typical lesions (histopathological if gross lesion is atypical). Better shipping hygiene with improved final housing and avoidance of contact with open cases

in primate or man, are most important if the incidence of acquired primate tuberculosis is to be lowered.

REFERENCES

1. Hoare, E. Wallis. *A System of Veterinary Medicinc.* Balliere, Tindall and Cox, London, 1913. p. 109.
2. Calmette, Albert. *Tubercle Bacillus Infection and Tuberculosis in Mon and Animols.* Williams & Wilkins Co., Baltimore, U. S. A., 1923, p. 346.
3. *Proceedings and Report of Zoölogical Gardens.* New York Zoölogical Society; Zoölogical Society of London; Philadelphia Zoölogical Society; etc.
4. Harry M. Wegeforth, M.D., President of the Board of Directors of the Zoölogical Society of San Diego, Calif.:
"In my travels in the Orient I found a high incidence of tuberculosis in the native popula-
- tion . . . Native monkeys adjacent to populous areas do make contact with tuberculous sputum. Herbert C. Clark, Director Gorgas Memorial Laboratory, Ancon, Canal Zone, has killed 539 mookeys in their native forest and has never demonstrated tuberculosis in the native troupe."
5. Frost, W. H. How Much Control of Tuberculosis? *A.J.P.H.*, 26, 8:764 (Aug.), 1937.
6. Whitney, J. S., and McCaffrey, I. A Summary of the Results of Group Tuberculin-testing with P.P.D. in the United States. *Am. Rev. Tuberc.*, 35, 5 (May), 1937.
7. Hamerton, A. E. Report on the Deaths Occurring in the Society's Gardens During the Year 1935. *Proceedings Zoölogical Society.* London, Part III, 1936.
8. Fox, Herbert. *Discooses in Captive Wild Momols and Birds.* J. B. Lippincott, Philadelphia, 1923, p. 519.
9. White, C. Y., and Fox, H. Results of Tuberculin Tests in Monkeys at the Philadelphia Zoölogical Garden. *Arch. Int. Med.*, 4, 517 (Dec.), 1909.

American Verbosity

THE responsibility for American verbosity, I feel sure, lies with the very efficient American stenographer, and the temptation to garrulousness provided by the skill of her fingers. In some offices it seems that letter-writing has become a major undertaking, like writing for publication, and not a means to an end. There is no one who appears to be quite so well satisfied with the result of a day's work as the American business man who has dictated so many letters that his secretary has to work overtime transcribing them. The first practical evidence I had of the existence of the depression in America came when I noticed that the letters I received were fewer and shorter. Obviously, it had been necessary to reduce the staff of stenographers. Business must be improving now, the letters are growing in fre-

quency and length and will soon be what they were in 1928.

It is my candid opinion, after reading these letters for about 20 years, that half the typewriters in America could be scrapped and half the stenographers married off, and the wheels of business would run just as fast and with a good deal less noise and waste effort. Businesses in other countries are conducted successfully with only a fraction of the amount of correspondence Americans appear to find necessary. Every man whose business it is to dictate letters should be compelled to read over, at the beginning of every business day, the copies of the letters he dictated one year before and see for himself how many of them were twice as long as necessary, and how many were not necessary at all.—Carl Crow—Harpers', June, 1937.

Industrial Hygiene Applied to the Clothing Manufacturing Industry

WILMER H. SCHULZE, PHAR.D.

Director, Bureau of Environmental Hygiene, City Health Department, Baltimore, Md.

THE development of an industrial hygiene program in the Baltimore City Health Department was contemplated in 1931 and an opportunity to inaugurate actual field studies was presented during 1932 when the department was called upon to investigate alleged insanitary working conditions in some of the clothing manufacturing establishments in Baltimore. The Commissioner of Labor and Statistics of Maryland furnished a list of establishments in which the working environment might be found to be unfavorable. Inspections were made of this group of 206 plants, attention being given first to such items as were considered of most health significance, such as carbon monoxide hazards, the use of the common drinking cup and the common towel, and secondly to sanitation, lighting, and ventilation. Conditions found in many of the plants demonstrated the need for a study of the working environment in all establishments engaged in the manufacture of clothing.

In 1933, 3 inspectors of industrial hygiene were appointed in the Health Department. After a brief course of training in industrial hygiene they were assigned the task of making a survey of all clothing manufactories in the city. A survey card was designed to be used by the inspectors and included information pertaining to accident and health hazards, sanitary facilities, general sanitation, lighting,

and ventilation. The data from the cards were tabulated; and the percentage of establishments showing the different types of unsatisfactory working conditions are shown in the table. Comparison of these figures with those for 1932 indicated that carbon monoxide hazards were quite prevalent throughout the industry while insanitary working conditions were confined to a relatively smaller percentage of the plants.

Under a state law all clothing manufacturers are required to obtain a permit for operation from the State Commissioner of Labor and Statistics. It was agreed that these licenses be issued annually and would not be renewable unless the manufacturer cooperated with the Health Department by correcting unsatisfactory working conditions. To obtain improvements and to eliminate health hazards letters were written the managements of plants outlining the conditions which needed correction, explaining their relation to the health and welfare of their employees. These letters were followed up by visits to the plants, at which time further explanations of the contents of the letters were given and the interest and cooperation of the plant officials were solicited.

A second complete survey of the industry was made in 1934 to ascertain the effectiveness of the educational procedure carried on to obtain improve-

ments in working conditions. The results are given in the table and show a marked improvement in most of the conditions tabulated and demonstrate the value of educational efforts in an industrial hygiene program.

To determine the effectiveness of the program another complete survey was conducted during the winter months of 1936-1937. The results are also given in the table. While they show some improvement over the 1934 survey they indicate that attention need be concentrated on only a relatively few plants instead of a large percentage of the establishments.

The clothing manufacturing industry in Baltimore is composed of over 400 establishments employing from 2 to more than 100 employees. Of the 428 establishments inspected in the 1936-1937 survey 44 per cent employed 10 or less workers while 33 per cent employed between 10 and 50. Only 10

per cent of the plants employed more than 100 persons. With the industrial improvement during the last few years there has been a tendency toward moving into larger and more suitable quarters, with attending improvement in the general working environment.

Because of the prevalence of potential carbon monoxide hazards in the clothing manufacturing industry in connection with the use of gas fired hand irons for pressing and gas fired boilers considerable study was given these appliances. Actual determinations of the concentrations of carbon monoxide at breathing levels with the carbon monoxide indicator were carried out in a number of instances during all the surveys and in some cases concentrations above the physiological limit were found. These were generally due to leaky gas tubing, deterioration of appliances and defective venting of gas fired equipment. After corrections

TABLE I
*Surveys of the Clothing Manufacturing Industry**

	1932	1933	1934	1936-1937
<i>Number of establishments</i>	206	462	445	428
<i>Number of employees</i>		12,882	17,451	17,606
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Carbon monoxide hazards:				
Defective tubing	37	32	16	7
Defective venting	9	5	8	2
Common drinking cup	23	16	3	3
Common towel	26	7	2	1
Lighting, artificial—glare	18	54	..	11
Lighting, inadequate	15	24	5 †	1 †
Ventilation, fair or poor	20	5	4	1
Washing facilities, inadequate	20	1	2	1
Toilet facilities:				
Insanitary	43	14	8	6
Defective	12	9	5	6
Inadequate	19	10	4	4
Not ventilated	20	26	14	2
Sanitation, general, poor	27	3	2	2
Floors, insanitary	32	8	..	..
Walls and ceilings, insanitary	24	4	..	3
Hallways, dark	17	3	2	1

* Percentages refer to establishments

† Sight Meter readings on work-plane

were made subsequent tests were carried out to insure elimination of the carbon monoxide hazard.

SUMMARY

A study of working conditions made during 1932 in a representative number of clothing manufacturing establishments revealed the existence of health hazards in addition to insanitary con-

ditions in a significant percentage of the plants. By applying educational efforts in the form of reports to and conferences with responsible plant officials marked improvements in the working environment were attained. The results of this application of industrial hygiene services to the clothing manufacturing industry over a period of several years are shown in the table.

Nutrition

IN routine examinations, physicians differ widely in their estimates of the nutritional status of the same children.

The differences in judgments are so great that estimates based on a single examination are of little value in determining the relative amount of malnutrition among any group of children at any one time or changes in the amount from one time to another. Neither are these nutritional estimates reliable bases for determining which children of a group are malnourished.

It is therefore suggested that prac-

tical nutritional programs be focused on correcting the faulty food habits of children rather than expending energy on routine examinations to determine nutritional status. It is also proposed that research workers concentrate on the construction of valid methods of determining nutritional status rather than making surveys which are of doubtful significance because of the inaccuracies of the estimates upon which their findings are based.—Reliability of Medical Judgments on Malnutrition, by Mayhew Derryberry, *Pub. Health Rep.*, Vol. 53, No. 7, February 18, 1938.

Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia*

SAMUEL R. HAYTHORN, M.D., AND HARRY B. MELLER

Director of the William H. Singer Memorial Research Laboratory of the Allegheny General Hospital; Head of Air Pollution Investigation, Mellon Institute and Chief of the Bureau of Smoke Control, Pittsburgh Department of Health, Pittsburgh, Pa.

THIS report represents another step in the program of studies made over a number of years by an interested Pittsburgh group in an effort to find the relation which they feel exists between the local smoky atmosphere and the high death rate from pneumonia. Most of the more recent studies on the effects of dust have dealt with various forms of industrial pneumoconiosis. Clinical investigations of employees, group surveys, and roentgenologic examinations of large numbers of workers engaged in like occupations and supplemented by animal experimentation have united to advance our knowledge of the importance of air pollution on the health of industrial workers, but the fact that there are milder changes in the respiratory systems of persons living in smoky and dusty atmospheres which appear to influence health has received only casual attention.

Pittsburgh presents an unusual opportunity for the study of the relation of smoke to pneumonia for two reasons: The annual death rate from pneumonia is higher than that for the State of Pennsylvania, and the atmosphere is laden with dust and smoke, particularly during the fall and winter months when

the rate is highest. Several efforts have been made to show whether the relation is that of cause and effect or merely coincidence, and it is our present purpose to review the evidence accumulated and to add to it the data acquired through the analysis of the findings in the lungs of 3,000 persons dying from various diseases in Pittsburgh hospitals. The examinations were made for the purpose of determining the kinds and extent of lung changes and the amount of visible dust deposits. It should be emphasized that this series of cases does not comprise an industrial group but represents a cross-section of the general inhabitants, including women and children as well as representatives of the professions and those of dusty and non-dusty trades. After the first series, children under 10 years of age were omitted.

The first comprehensive study of Pittsburgh's smoke problem was conducted by the Mellon Institute of Industrial Research in 1911-1913.¹ In commenting on certain medical phases of the problem, White² called attention to the fact that the "smokiest" wards had the highest death rates from pneumonia. This observation was substantiated in sootfall studies made in 1923-1924 and 1929-1930 by one of us (Meller).³ The statement could not be accepted as final until other environmental factors were in-

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

vestigated for the reason that sections having the highest sootfall were in the valleys, along the rivers and railroads and in the vicinity of industrial plants where economic conditions and occupational factors sometimes complicated the picture. Moreover, sootfall alone cannot be taken as a perfect indicator of respiratory damage, since it includes those particles that fall by gravity or are brought down by rain, whereas it is only the very small particles (10 microns or under) that are retained in the lungs.

A second observation¹⁰ made during the early investigations was to the effect that a higher per cent of pneumonias than had been reported elsewhere failed to resolve in the usual way by crisis and healed by organization of the exudate in a way similar to the process of healing of an incised wound. It was suggested that this type of healing resulted from imperfect drainage of groups of air sacs due to the closure of lymphatic channels by dust deposits.

In addition to the sootfall studies mentioned, it has been noted from time to time that following periods of several days of continuous smog (mixtures of smoke and fog) the number of deaths from pneumonia is increased. This observation could easily be evaluated if incidence rates of a dependable character, rather than death rates, were available.

It is obvious, when suspended solids are considered, that the concentration at a given time depends largely upon three factors: volume of pollution admitted to the atmosphere, especially during the winter or heating season; the temperature, which controls to a large extent the amount of fuel used for heating purposes; and the velocity of the wind necessary to carry the smoke away. Observations with the Owens's automatic filter in use in Pittsburgh show that there is a high

degree of correlation among these factors in the production of smog.

The data on weather conditions and the daily death rates from pneumonia have been kept for several years, and tables placing these facts side by side have been compiled. One difficulty has been to get a basis for analysis that can be depended upon. The first problem was to calculate the amount of time that must elapse between a smog period and the time at which its effects, if any, would be reflected by the pneumonia death rate. Meakins⁴ states that where the incubation period of pneumonia is known, it is usually from 36 to 48 hours and that while resolution by crisis may occur any time from the 3rd to the 14th day, it rarely occurs before the 5th, and is more likely between the 5th and 9th days. Death may occur at any time, but generally is related to the critical period. With full appreciation that this period may vary more or less either way, we allowed 2 days for the incubation period and 6 to 8 days for the termination of the disease, and assumed that the period of 8 to 10 days would be the probable time for the rise in the death rate to appear.

Actually, periods of smog, during the winter months, are commonly followed after several days by periods during which an increased pneumonia death rate occurs. While these examples do not appear with sufficient regularity to be conclusive and do not always fall at the times they are expected, they are frequent enough to be suggestive. The following tabulations are examples of the relation of wind velocity, temperature, and smog to the death rate of pneumonia (see Tables I, II and Graph I).

VARIATION IN PNEUMOCOCCUS TYPES IN PITTSBURGH

Another angle to the problem has been the persistence for at least 15

TABLE I

Comparison of Wind Velocity, Temperature, and Pneumonia Mortality During Month in Which Smogs Occurred

Date 1928	Ave. Wind Vel.	Ave. Temp.	Pneumonia Mortality			
			8th Day	9th Day	10th Day	Total 3 Days
Dec. 9	5.9	26	8	8	7	23
10	7.5	32	8	7	7	22
11	5.3	39	7	7	13	27 Smog
12	2.7	38	7	13	4	24 Smog
13	3.7	46	13	4	5	22 Smog
14	4.8	45	4	5	17	26 Smog
15	6.4	44	5	17	13	35 Smog
16	5.2	48	17	15	15	45 Smog
17	15.6	44	13	15	9	37
18	16.2	31	15	9	9	33
19	13.1	36	9	9	10	28
20	13.0	26	9	10	7	26
21	9.3	16	10	7	20	37
22	3.8	26	7	20	23	50 Smog
23	2.3	34	20	23	19	62 Smog
24	5.8	36	23	19	19	61 Smog
25	6.6	40	19	19	17	55
26	5.5	38	19	17	25	61 Smog
27	6.7	40	17	25	13	55 Smog
28	10.3	38	25	13	17	55
29	12.7	34	13	17	15	45
30	8.5	29	17	15	12	44
31	3.2	36	15	12	9	36

GRAPH I

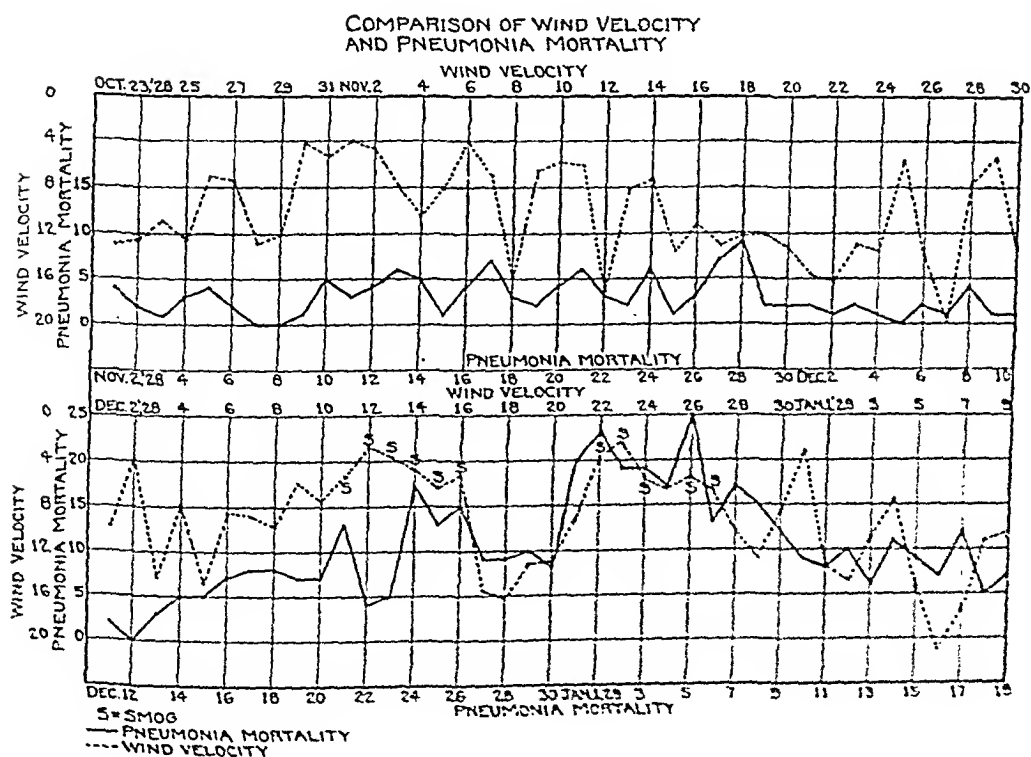


TABLE II
Comparison of Wind Velocity, Temperature, and Pneumonia Mortality

		Pneumonia Mortality					
Date		Ave. Wind Vel.	Ave. Temp.	8th Day	9th Day	10th Day	Total 3 Days
1933							
Oct.	11	12.2	57	0	3	3	6
	12	11.3	57	3	3	2	8
	13	7.2	48	3	2	5	10
	14	4.2	47	2	5	4	11
	15	6.4	56	5	4	1	10
	16	12.6	62	4	1	2	7
	17	10.4	54	1	2	2	5
1934							
Feb.	1	12.9	28	3	3	0	6
	2	9.2	18	3	0	4	7
	3	7.5	18	0	4	2	6
	4	12.7	32	4	2	3	9
	5	8.0	24	2	3	6	11
	6	7.8	19	3	6	3	12
	7	13.1	22	6	3	4	13
	8	11.9	4	3	4	6	13
	9	9.5	1	4	6	11	21
	10	7.0	16	6	11	5	22
	11	9.7	29	11	5	4	20
1936							
Jan.	4	10.8	40	6	6	0	12
	5	14.0	32	6	0	2	8
	6	8.3	35	0	2	7	9
	7	8.8	37	2	7	4	13
	8	15.5	36	7	4	5	16
	9	11.4	42	4	5	3	12
	10	10.0	36	5	3	5	13
	11	7.5	38	3	5	6	14
	12	10.4	41	5	6	4	15
	13	17.2	42	6	4	3	13
	14	8.8	39	4	3	4	11

years of more than 50 per cent of pneumococcus types in groups higher than the fixed Types I, II, and III. McMeans, 1918-1926,⁵ and Robinson, 1925-1935⁶⁻⁷ reported on typings made routinely on all pneumonia cases admitted to hospitals. Many of the strains less commonly recorded in reports from eastern cities have been found to be rather common and very virulent here. During the highly fatal epidemic of 1936-1937, the collected reports of typings from 7 Pittsburgh hospitals showed 65 per cent that fell in the group formerly classed as Rockefeller Type IV.

PITTSBURGH'S PNEUMONIA MORTALITY RATE

In the foregoing discussions several references have been made to the high pneumonia death rate. A review of the

annual rates for males, females, and totals for the last 10 years is submitted in support of the statements (see Table III).

Prior to 1927 the rate was commonly more than 200 per 100,000 inhabitants, and in 1923 an all-time peak of 374.4 was reached. In comparing the city rate with that of Pennsylvania State, the Pittsburgh rate is often as much as 40 per cent higher. For 1935 the city rate was 140.5; the Allegheny County rate was 121.9; and the state rate was 83.5 per 100,000.

Meakins gives the death rate for women as generally higher than men and the ratio as about 27 to 20. The rates for males and females were computed separately in the hope that the influence of industrial factors would be brought out. The number of males exceeded the females each year for the

TABLE III
Ten Year Mortality Rate for City of
Pittsburgh

Year	Males Per 100,000	Females Per 100,000	Total Per 100,000
1927	197.1	122.3	159.6
1928	238.1	186.5	212.6
1929	226.1	127.9	176.7
1930	224.3	125.7	174.7
1931	287.8	131.1	208.8
1932	166.5	126.1	146.1
1933	107.1	76.8	91.8
1934	169.8	99.6	134.5
1935	168.5	112.9	140.5
1936	210.1	125.2	167.4

time studied. The factors leading to the reversal of sex occurrence were not apparent.

It is further seen in the chart that during the years from 1932 to 1935 when the depression was at its height, when air pollution from industrial flues was greatly decreased and when economic and living conditions were at their worst, there was a great decrease in the number of deaths from pneumonia. However, the decrease occurred in females as well as males so that the change cannot be attributed to conditions within the plants, such as overheating and rapid chilling of the employees.

NECROPSY STUDIES

The accumulated facts brought out in the above review led to a search of the postmortem records of several large hospitals for additional data that might bear on the pneumonia problem.

As the first step, the lungs, removed at autopsy from 3,000 persons dying from any cause in our general hospitals, were graded microscopically for the amount of extraneous pigment and the resulting fibrosis. Later, the presence of "all forms" of pneumonia including bronchopneumonia, lobar pneumonia, hypostatic pneumonia and organizing pneumonia was recorded by grade. The analyses and gradings were made in 3 series. In 1933 Schnürer, Allison, Boucek, and Hay-

thorn^s published a preliminary report on the analysis of 2,499 postmortem examinations graded for "anthracosis" * on the following criteria:

Grade I. Carbon pigment phagocytes in alveoli. Few in perivascular lymphatics.

Grade II. Wide distribution of phagocytes—in all portions not averaging more than three rows of cells.

Grade III. Widespread distribution of phagocytes of three or more rows of cells. Moderate compression of cells by fibrous tissue.

Grade IV. Extensive distribution of phagocytes with fibrosis in peribronchial, perivascular and subpleural lymphatics.

Grade V. Excessive fibrosis and pigmentation—puckering of pleura—perivascular—peribronchial—and intra-alveolar accumulations of phagocytes.

The first report included consecutive autopsies from several large hospitals in the City of Pittsburgh† covering a period from 1912 to 1935.

The second series was made by Schnürer⁹ who reviewed 342 cases at the City Home and Hospital at Mayview, about 8 miles from the city, and the tuberculosis camp of that institution.

A third series was graded by Haythorn on cases over 12 years of age during 1934–1935 in order to bring the total number of cases up to 3,000.

Table IV shows the separate gradings for each series and the total results for the 3,000 cases. The results were fairly consistent in each series. Series 1 and 3 were made up of general hospital cases and included the records of persons of all ages and walks of life. The second series was a limited group of indigents whose average age fell within the period of life at which pneumonia is most common.

* While the series contained examples of other forms of pneumoconiosis, such as bituminosis and anthracosilicosis, the term anthracosis is used as the best known and at the same time the least used in reporting industrial diseases.

† Allegheny General Hospital, Mercy Hospital and Pathological Department of the University of Pittsburgh.

TABLE IV

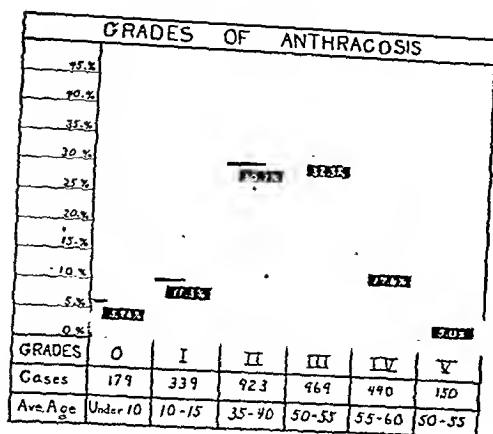
	Series 1	%	Series 2	%	Series 3	%	Total	%
Pigment Free	179	7.16	0	0.0	0	0.0	179	5.95
Grade I	289	11.56	30	8.77	20	12.57	339	11.30
Grade II	767	30.69	112	32.74	44	27.67	923	30.76
Grade III	778	31.11	146	42.69	45	28.30	969	32.30
Grade IV	354	14.14	46	13.45	40	25.15	440	14.66
Grade V	132	5.03	8	2.33	10	6.28	150	5.00
	2,499	99.69	342	99.98	159	99.97	3,000	99.98

The age factor is very important with reference to pneumonia incidence, and the average ages for the various grades were found to be: Grade 0, under 10 years; Grade I, 10 to 15 years; Grade II, 35 to 40 years; Grade III, 50 to 55 years; Grade IV, 55 to 60 years; and Grade V, back to between 50 and 55 years.

For comparison, the sex incidence had to be reduced to per cent rather than cases, since considerably more men than women were examined. The percentage sex-incidence was about equal for Grades I, II, and III, largely male for Grade IV, and almost entirely male for Grade V (see Chart 1).

Based on sex and age incidence, Grade IV was a mixed occupational and non-occupational group, while Grade V was definitely occupational and included 41 cases that had given their occupations as coal miners.

CHART 1



■ = Grades of Anthracosis

There was some unavoidable overlapping in Grades IV and V so that too sharp conclusions could not be drawn in separating them.

VARIETIES OF PNEUMONIA INCLUDED

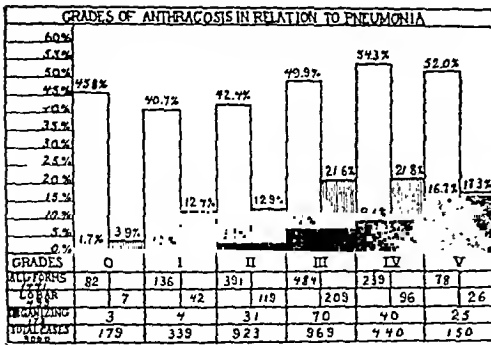
It is not always possible to differentiate the various forms of pneumonia, either clinically or by microscopic examination. In contrast, lobar pneumonia is a definite clinical and pathological entity. Therefore, in Chart 2, the occurrence of pneumonia is classified as "all forms" including bronchopneumonia, lobar pneumonia, septic pneumonia, hypostatic pneumonia, and organized pneumonia. Lobar pneumonia was then tabulated separately in another column. Organization was accepted when areas of healing with the formation of new vessels and proliferating fibrous elements were present in the alveolar exudates but was excluded when found to be associated with infarction, gangrene, chronic empyema or tuberculosis.

Separate tables were prepared to show the pneumonia incidence by grades for each of the 3 series, but the differences found were slight and do not justify their inclusion in the report. Only the composite totals are shown in Chart 2.

While pneumonia in some form was present in 47 per cent of the cases, it must not be forgotten that the entire group was made up of hospitalized, sick patients and that many of the pneumonias were terminal infections rather than primary diseases.

In trying to answer the question as

CHART 2



- = All Forms of Pneumonia
 ▨ = Lobar Pneumonia
 ■ = Organizing Pneumonia

to whether anthracotic deposits in the lungs predispose to pneumonia or tend to make it more fatal, we compared the lesions with the relative mortality as it was found in the several anthracotic grades.

The per cent of pneumonia "all forms" was quite constant in Grades 0, I, and II and ranged from 40.7 per cent to 45.8 per cent. The average age of each of these grades was under 40 years, before which time pneumonia is generally less fatal than in later years. In contrast, the average ages for each of Grades III, IV, and V fell between 50 and 60. Yet, the rate was 49.9 per cent in Grade III, 54.3 per cent in Grade IV, and 52 per cent in Grade V, suggesting that factors other than age were needed to explain the differences in per cent between the latter 3 grades.

Theoretically, lobar pneumonia should have been a better index than "all forms" since it is less frequently a terminal infection. Here again, definite conclusions could not be drawn because the age factor could not be evaluated. Grouping Grades 0, I, and II, there were 1,441 individuals in-

cluded and only 168 of the 499 cases of lobar pneumonia found in the 3,000 records studied. Since it is well known that pneumonia in children and young persons almost always heals by crisis, the fact that the lymphatics had not been seriously damaged in these earlier groups may have been a factor.

Beginning with Grade III, the pneumonia age was entered, and the lobar pneumonia incidence rose from 12.9 per cent to 21.6 per cent. In Grade IV it remained constant at 21.8 per cent, and in Grade V it receded to 17.3 per cent. The decrease may have been apparent, due to the fact that Grade V included only 150 persons and was too small for conclusions.

When organizing pneumonia was studied, significant facts began to appear. When Grades 0, I, and II are combined, the number of instances in which organization was found to be present was only 2.63 per cent. When Grade III was examined, not only was it found that the pneumonia incidence had increased, but there was a very appreciable amount of blockage of the lymphatics and an accompanying rise in the incidence of organization to 7.2 per cent. In Grade IV the lymphatic blockage was progressively greater, and the organization incidence again increased to 9.1 per cent. By the time Grade V was reached, there could be no doubt about increased incidence of organization, since it reached 16.7 per cent, and all of the 3 series of gradings, made separately, showed comparable advances.

Grade V appeared to be an industrial group. The lungs showed heavy, black pigment deposits in the subpleural, peribronchial, and perivascular lymphatics with definite microscopic, fibrous tissue changes and small emphysematous pockets in the air sacs about the fibrous thickenings. Of the 150 cases in this group, 25 presented

greater or lesser areas of exudate undergoing healing by organization.

Two of many things may have contributed to the organization: The closed lymphatics may have made healing by crisis difficult by decreasing the facilities for drainage and the small areas of emphysema may have been foci of relative inactivity during the respiratory expansions of the lung tissues. While it has not been shown that the expansile action has anything to do with the rapid resolution of the pneumonic exudate, it is likely that it does.

There were a few instances of anthraco-silicosis in Grades IV and V, but these did not seem to show any greater amounts of organization than did the lungs with the black, almost non-crystalline pigment deposits.

There could be no doubt that organizing pneumonia was more prevalent in the high grades of anthracosis, although the evidence as to whether the relation is that of cause and effect was not proved.

CONCLUSIONS

1. The protocols and microscopic sections of 3,000 necropsies were reviewed, the cases separated into pigment-free lungs and 5 grades of anthracosis depending upon the amounts of extraneous pigment and the fibrosis present. Grades 0, I, and II appeared to have no particular occupational basis. Grade III was a mixed non-occupational and occupational group. Grades IV and V were largely, although not exclusively, occupational.

2. The incidence of pneumonia "all forms" and of lobar pneumonia was tabulated in relation to each grade of anthracosis. In spite of the high local pneumonia death rate, no anatomical evidences of a relation between the incidence of pneumonia and the milder

grades of anthracosis in the non-occupational groups could be demonstrated.

3. In Grades III, IV, and V there was a definitely higher percentage of pneumonia cases, but the average age for each of these grades coincided with the period of life at which the pneumonia death rate in less smoky communities is likewise highest.

4. Healing by organization of unresolved pneumonia was consistently higher in all of the more advanced grades of anthracosis and greatest in Grade V. The organizing foci appeared to be associated with heavy pigment deposits, microscopic areas of fibrosis, and isolated emphysematous pockets in fibrosed portions of the lungs.

5. Nothing tangible was found to connect the pigment deposits with the high pneumonia incidence and high mortality rates, but the association of severe anthracosis and healing by organization formerly reported was verified.

REFERENCES

1. Papers on the Influence of Smoke on Health. Mellon Institute Bull. 9, University of Pittsburgh. Pittsburgh, Pa., 1914.
2. White, William Charles, and Marcy, C. H. A Study of the Influence of Varying Densities of City Smoke on the Mortality from Pneumonia and Tuberculosis. *Trans., Fifteenth Internat. Cong. of Hyg. and Dem.*, Sept. 12, 1912.
3. Meller, H. B. *Mech. Eng.*, 48, 11a:1275-1283 (Mid-Nov.), 1926.
4. Meakins, J. C. *The Practice of Medicine*. Mosby, 1936.
5. McMeans, J. W. Incidence of *Pneumococcus* Types in Pneumonia in Pittsburgh. *Atlantic M. J.*, 30:499-503 (May), 1927.
6. Robinson, G. H. The Immunologic Relations of Type IV *Pneumococci* Obtained During an Epidemic. *J. Infect. Dis.*, 41:417-22 (Dec.), 1927.
7. Robinson, G. H. The Incidence of Various Types of *Pneumococci* as Found at the Allegheny Gen. Hosp. Read before the Pittsburgh Clinical Path. Soc., Nov., 1935.
8. Schnurer, L., Allison, W. C., Boucek, C. M., and Haythorn, S. R. *Pneumoconiosis in the Pittsburgh District*, etc. *J. Indust. Hyg.*, 17, 6:294 (Nov.), 1935.
9. Schnurer, L. Further Studies on *Pneumoconiosis* to Respiratory Diseases. Accepted for publication in *J. Indust. Hyg.*
10. Haythorn, S. R. Some Histological Evidences of the Disease Importance of Pulmonary Anthracosis. *J. Med. Res.*, 29, 2:259-279 (Dec.), 1913.

Physique and Health

JESSE FEIRING WILLIAMS, M.D., F.A.P.H.A.

Professor of Physical Education, Teachers College, Columbia University, New York, N. Y.

THE thesis frequently put forward in these days that the growth in social institutions lags behind the development of industrial and economic organization would find analogy in the monograph, *Physique and Health*, by Dr. C. Wroczynski.¹ He contends that man lags in acquiring physique and health. But the doctor, who is Chief Medical Adviser to the Ministry of National Education, Warsaw, is not as pessimistic as the Bishop of Calcutta who wrote, "every prospect pleases, and only man is vile." Apparently we seemed to be doing very well for some years, and then we began to slip. "Despite the strain of the changing conditions of life, it seemed that, thanks to the advance of civilization, the human body might develop towards a state of perfection. Most of the immediate dangers arising out of physical and social emergencies had been removed, the average length of life was increasing, the causes of early death were being overcome. All that remained then was to continue along the same lines."

But somehow or other we have failed to do so. From an extensive inquiry among scientific persons in 9 European countries, many data are assembled attesting to the physical deterioration of man. The number, kind, and range of physical defects among children and adults are presented; the percentages reported are disturbing. There are indeed too many mal-

nourished, rickety children in the world; needless dental caries, postural and muscular weaknesses abound; and the increase of nervous, maladjusted, and neurotic individuals alarms thoughtful persons. But the case is not strengthened by exaggeration. It is bad enough even if not growing worse: the evidence is not available that "man is undergoing profound and rapid biological changes." At all events Wroczynski thinks he is and inquires into the responsibility of physical education in the matter.

The rôle of physical education in the development of physique and in the correction of physical defects has a long and interesting history. The Ling gymnastics of Sweden arose in response to just these conditions that Wroczynski describes. We may agree with Voltaire that perfection comes slowly, but the purpose to use physical exercise in quickly rehabilitating degenerate man runs through the whole European effort in physical education.

Obviously there are two ways of looking at the biologic problems of human life. One is represented in Wroczynski's report. He writes, "Up to the present, modern methods and systems of physical education . . . have not produced on the health of the masses any effect demonstrable by statistical methods. To tell the truth gymnastics and sport are not practised on scientific lines." In the United States a similar view is voiced at times.

learn the never to be forgotten lessons that come from real experience with the creative forces of nature. It is possible to develop interests and skills in activities that enrich the whole of life, that habituate people to a way of life rather than to a concern for and care of muscles, bones, and bowels. Moreover, this approach is not blind to the facts. It would not ignore the defects of structure and function that are remediable by exercise. The corrective classes in schools and the restricted groups in colleges attest to the purpose and ability to use the therapy of special exercise when it is called for. But it would refuse to establish general educational policy based upon the limitations of abnormal children.

The extent to which defective structure and function is held as a standard is well illustrated by Roger's contention that competition in sports seeks to humiliate opponents and therefore should be abolished. It should be noted that while some persons may be humiliated when they lose, there is no humiliation unless a faulty education has taught them to expect to be always right and never to lose. Persons who are humiliated when they lose in games need special care exactly as do others who are timid, shy, secretive, unduly sensitive, fearful, and vain. To set a standard of social activity that is based upon the abnormal response of a player who is humiliated when he loses would correspond to establishing a diet based upon carious teeth and inability to masticate, or a standard of honesty based upon the behavior of a kleptomaniac.

It is obvious then that the educational approach for physical education does not ignore individual differences. It agrees with Labbé that physical education should consider the requirements of age, sex, and constitutional aptitude, and also the preferences, traditions, living conditions, and climate of a

country. There are some desirable norms in structure and function that can be used, but as Wroczynski points out the work on children is concentrated too largely on the first year of life, "as if normal growth were confined to that period." Research on functional norms is needed.

There are many interesting technical points presented. An American reader of this excellent monograph will be surprised at the recommendation that medical supervision of sport should be *introduced*. In the United States medical supervision of sport goes back to the early work of Hitchcock at Amherst that began in 1861 and widely prevails in colleges and universities today. But Wroczynski's argument for medical and scientific study of students, not only "to determine general fitness of each" but also "to bring to light his particular constitutional aptitudes" and needs point the way for progress in medical supervision in this area. Increase in height over several generations shows substantial gains for the Netherlands and the Scandinavian countries, and, using the army figures, the United States shows none. If, however, the data of American college men and women were used the improvement would be marked. It is refreshing to read the comment on breathing exercises: "It may be doubted whether deliberate aeration of the lungs is really useful," and Busing's opinion that for young people today, "foot gymnastics are more important than the respiratory gymnastics that are so generally employed and so highly recommended." Some day all physical educators in the United States will learn the simple physiology of the matter and will understand breathing in relation to function.

The conclusion that "an adequate range of free movements repeated several times during the day under natural conditions (not in classrooms),

is more effective (for growth) than any kind of artificial, indoor gymnastics," agrees with competent American medical and educational judgment. American coaches would do well to reflect upon the statement: "The one established point seems to be that serious competitive athletics are forbidden to boys under 18." We are more conservative in the United States with our girls and women than with our boys and men. Chailly-Bert and Bensidoun recommended high jumping for girls and women and the former advises 1,000 meter cross-country races for women. Neither proposal would be accorded agreement here.

The monograph is challenging; the range of topics discussed is wide; the European data are well sampled. Either physical education shall be organized on the basis of human defects or with respect to kinds of living that can go on. In the decision perhaps an American, most of all, would be helped by Lin Yutang's recent book, *The Importance of Living*. In any event

there are two attitudes in modern life. One leads to work, to factory, to office, to desk, with the hope of buying happiness with the money that is earned, and with unwarranted reliance upon special exercises to correct the physical deficiencies of life. The other attitude leads also to vocational effort that secures the necessities of independent, self-sustaining life, but around the margin are play and recreation that are also a part of life, just as vital as work that is needed to be done and that all wish to do. In this adventure in human living, physical education may always be an interpreter of living, an awakener of interests for leisure time, a teacher of skills that function, and a leader to the out-of-doors. It is for physical education to decide which road shall be travelled by man in the varied experiences of life. The gates are open. The highway is ahead.

REFERENCE

1. *Bull. Health Organization, League of Nations*, VI, 4, August, 1937.

Making Britain Safe for Youth

WE keep thinking about the British censor's opinion that "Snow White" is unsuitable for children under 16; can't get it out of our head.

"Mother, may we go to see 'Snow

White'?"

"No, dear, it's too gruesome. Why don't you and Tommy play some nice quiet game? Why don't you go to the nursery and practice your gas-mask drill?"—From the *New Yorker*.

Problem of the Causes of Stillbirth*

ETHEL C. DUNHAM, M.D., ELIZABETH C. TANDY, D.Sc.,
F.A.P.H.A., EDWIN F. DAILY, M.D., AND
CLARA E. HAYES, M.D., F.A.P.H.A.

Children's Bureau, U. S. Department of Labor, Washington, D. C.

EVERY year more than 77,000 stillbirths are registered in the United States. This number, however, represents only a part of the total number of fetal deaths, since registration of products of conception of periods of gestation before the 5th month is not required in most states. There are, in addition, more than 63,000 infant deaths annually that are due to natal and prenatal causes, 89 per cent of which occur in the 1st month of life. These serious losses of life in the fetal and neonatal periods are causing great concern, particularly in the presence of a low and falling birth rate. In connection with these problems it must be pointed out that the stillbirth rate has not decreased appreciably in recent years and that mothers whose infants are stillborn die much more frequently than mothers whose infants are live born.

Statistics issued by the Bureau of the Census do not, however, show the real magnitude of the problem. Registration of stillbirths is incomplete practically everywhere in the United States. There is no single definition of stillbirth in general use, and the period of gestation required by law in the different states for reporting stillbirths

varies widely. Furthermore, information with regard to causes of stillbirth is unsatisfactory because there is no acceptable classification of causes of stillbirth which include rules for assignment of cause.

Numerous reports dealing with causes of stillbirth are found in the literature, but their usefulness is limited because in only a very small proportion of them have comparable bases for analysis been used with respect to period of gestation and definition of stillbirth.

Because of the seriousness of the stillbirth problem and the lack of information on causes of stillbirths, the Children's Bureau in March, 1936, in coöperation with the Sub-committee on Stillbirths of the American Public Health Association, undertook a study of a large number of stillbirths occurring in hospitals. The objectives of the study were: (1) to obtain accurate data which would throw light on the causes of stillbirth and indicate methods for reducing the high mortality; (2) to develop a new classification of causes of stillbirth, including rules for assignment of cause. This report deals only with the first of these objectives. It is, of course, appreciated that although data obtained from hospitals are more complete than those obtained through ordinary registration, they are not necessarily representative for the country as a whole.

* Read at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

FIGURE I

STILLBIRTH STUDY*

(Stillbirths of 20 Weeks or More Gestation)

CHILDREN'S BUREAU
U. S. Department of Labor

- Name of hospital _____ City _____ Hospital Case No. _____
- Mother: (a) Name _____; (b) Age _____; (c) Race _____; (d) Delivered at _____
- Fetus: (a) Sex _____; (b) Period of gestation _____ (weeks); (c) Length _____; (d) Weight _____; (e) Single birth, twin, triplet, or other _____; (f) If plural birth, number in order of birth _____
- Number of children of this mother (at time of this birth and including this child) _____
(a) Born alive and now living _____; (b) Born alive but now dead _____; (c) Stillborn _____
- Pregnancy: (a) Was pregnancy normal? _____; (b) Specify complications** _____
(c) Was serological test for syphilis taken during this pregnancy? _____ Result _____ Date _____
- Labor: (a) Total duration _____ (hours); (b) Was labor induced? _____ Complications of labor _____
(c) Specify method or methods of induction _____
(Excludes: Drugs, bag, force, pack, etc., and rupture of membranes prior to onset of labor)
- Was there an operation for delivery? _____ Name of operation _____
(Excludes: Low, mid, and high forceps, version and extraction, breech extraction, Caesarean and mutilating operations, including craniotomy)
- Specify all drugs and anesthetics given during labor and delivery _____
- When did fetal death occur: _____ (Excludes third stage of labor)
(a) Before labor _____ 10. Was fetus macerated? _____
During labor _____ (b) Before operation _____
During operation _____ 11. Was autopsy performed? _____
- Causes of stillbirth (indicate primary cause):** _____
(a) Determined in fetus _____
(b) Diseases and conditions in mother during pregnancy and labor _____

Record prepared by _____ Date _____

* A study by the Children's Bureau with the cooperation of the Subcommittee on Stillbirths of the American Public Health Association and individual hospitals.
** See instructions on reverse side.

On the face of the schedule (Figure I) prepared for use in the study appear certain items taken from the standard certificate now in use for the registration of stillbirths and additional items to obtain medical information essential for an understanding of the cause or causes of stillbirths. On the reverse side of the schedule are set forth the scope of the study with respect to the uterogestation, the definition of stillbirth and the instructions for entering information on special items. The period of gestation (20 weeks or more) used as a basis for the inclusion of a stillbirth in the study is that recommended for nation-wide adoption by the Sub-committee on Stillbirths of the American Public Health Association. The definition of stillbirth is that incorporated in Rules of Statistical Practice of the Association, namely*:

A stillborn child is one which shows no evidence of life after complete birth (no

breathing, no action of heart, no movement of voluntary muscle). Birth is considered complete when the child is altogether (head, trunk, and limbs) outside the body of the mother even if the cord is uncut and the placenta still attached.

Two hundred and twenty-nine hospitals in 49 cities in 26 states and the District of Columbia (Figure II) co-operated in the study by assigning a member of the medical staff to be responsible for filling in the items on the schedule for every stillbirth occurring in the hospital during the period of the study. The present report is based on the data obtained from 6,750 schedules received from these hospitals during the period February 1, 1936, to June 1, 1937.

From an analysis of the data on the schedules certain basic information has been obtained with respect to age and

* See Report of the Sub-committee on Stillbirths (Haven Emerson, Chairman), *A.P.H.A. Year Book 1935-1936*, p. 244.

TABLE I
*Time of Fetal Death with Respect to Labor
By Race*

	Total	Died Before Labor		Died During Labor	
		Number	Per cent	Number	Per cent
Total	6,367	3,713	58.32	2,654	41.68
White	5,162	2,908	56.33	2,254	43.67
Negro	1,135	766	67.49	369	32.51

parity of mothers, incidence of plural births, and sex and color of the still-born infants. As was to be expected in a study of hospital cases, it was found that the mothers were slightly older and that there was a greater proportion of primiparae and of white mothers than is shown by census reports on stillbirths. Data in regard to sex of the stillborn infants and in regard to the incidence of plural births were, however, in close agreement with census figures.

The stillbirths were studied (1) in

relation to whether the fetal death occurred before the onset of labor or during labor, (2) in relation to the period of gestation at which stillbirth occurred, (3) the method of delivery, (4) the frequency of certain complications of pregnancy and labor and certain conditions in the infants. The complications of pregnancy and labor were studied in relation to whether the physician recorded the condition as the cause of the stillbirth or regarded them merely as complications. Complete analysis of these data has not yet been

FIGURE II

GEOGRAPHIC DISTRIBUTION OF STATES AND CITIES IN WHICH 229 HOSPITALS
ARE COOPERATING IN THE STILLBIRTH STUDY

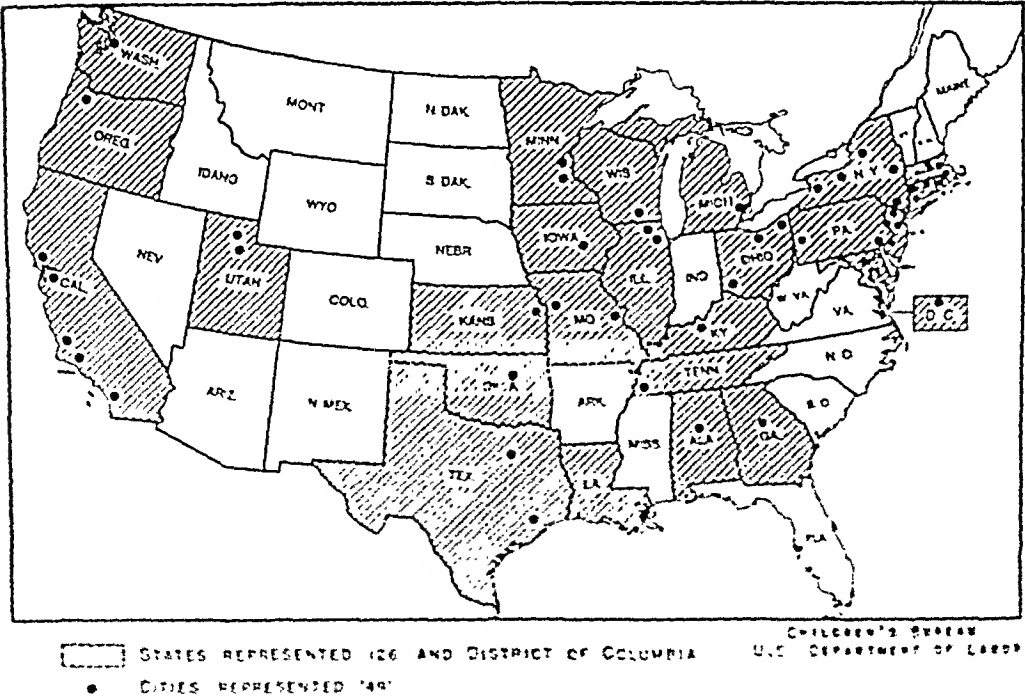


TABLE II
Time of Fetal Death with Respect to Labor
By Period of Gestation

	Total	Died Before Labor		Died During Labor	
		Number	Per cent	Number	Per cent
Total	6,367	3,713	58.32	2,654	41.68
Weeks of gestation					
20-27	1,084	840	77.49	244	22.51
28-35	1,756	1,298	73.92	458	26.08
36 or more	3,478	1,542	44.34	1,936	55.66
Not reported	49	33	.....	16	.....

made, but information of major importance in the attempt to understand the causes of stillbirth can be presented at this time.

The necessity of determining whether the fetus was dead before labor began or whether it occurred during labor would seem to be clear if satisfactory analysis is to be made of the effect of such factors as the method of delivery, period of gestation or the various complications of pregnancy and labor. Table I shows that more than half of the total number of fetal deaths studied (58 per cent) were reported to have occurred before the onset of labor and that the proportion of deaths occurring before labor among Negro fetuses was somewhat higher than among white.

Table II shows the time of fetal death with respect to the onset of labor in relation to the period of gestation at which stillbirth occurred. In the earlier periods of gestation (20 to 27 weeks and 28 to 35 weeks) the proportion of deaths occurring before labor

began was greater than the proportion occurring during labor. In the later periods of gestation (36 weeks or more) a greater proportion of stillbirths occurred during labor. In this connection it should be pointed out that in more than one-third of all the cases in which the fetus was alive at the onset of labor, labor was prolonged more than 24 hours.

Whether the fetus was dead or still living at the time an operative delivery was performed has been determined for the stillbirths that were reported to have been associated with operative delivery. Table III shows that in the total series of stillbirths 40 per cent of the deliveries were operative and that operation was more common among white than among Negro women. Table IV shows, however, that the operation could not be held responsible for the stillbirth in a great majority of cases, actually 72 per cent, because in this proportion of the operative deliveries death of the fetus had occurred before the operation was under-

TABLE III
Type of Delivery By Race

	Total		Operative Delivery		Non-operative Delivery	
	Number	Per cent	Number	Per cent	Number	Per cent
Total	6,744	100.0	2,684	39.8	4,060	60.2
White	5,445	100.0	2,335	42.8	3,112	57.2
Negro	1,175	100.0	304	25.9	871	74.1

TABLE IV

Time of Fetal Death with Respect to Operative Delivery by Race

<i>Operative Deliveries</i>	<i>Total</i>		<i>Died Before Operation</i>		<i>Died During Operation</i>	
	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>
Total	2,534	100	1,824	72	710	28
White	2,207	100	1,591	72	616	28
Negro	285	100	206	72	79	28

taken. The group of operative deliveries in which death of the fetus took place during operation, though representing 28 per cent of all operative deliveries, represents only 11 per cent of the total 6,750 stillbirths that have been studied. These facts make it clear that in the hospital cases here reported operative delivery did not play as important a rôle in causing stillbirth as it would have appeared to play if the time of fetal death had not been taken into consideration.

Although it is well known that certain complications of pregnancy and labor and certain abnormalities or other conditions in the fetus are often regarded as the cause of stillbirth, the frequency with which these same complications occur and are not regarded as cause has never been pointed out. Knowledge of the frequency of complication is basic to the determination of the rôle played by the different complications in causing stillbirth and will

be of value in developing a new classification that includes rules for assignment of cause.

In this study it has been found that those conditions entered on the schedules as complications of pregnancy or labor were entered also as causes of the stillbirth in a majority of the cases. When certain conditions found in the fetus were considered responsible for the stillbirth, they were always entered as a cause.

The incidence of the conditions studied and the frequency with which each complication of pregnancy or labor was reported as a cause, is shown in Table V.

Toxemia was the commonest complication of pregnancy found to be associated with stillbirth. It occurred in 1,601 of the 6,750 cases, 24 per cent of the total group. In 1,433 of these cases (21 per cent) the physicians indicated that toxemia was a cause of the stillbirth.

TABLE V

Frequency of Certain Conditions Associated with Stillbirth

	<i>Total</i>		<i>Mentioned as a Cause</i>		<i>Mentioned Only as a Complication</i>	
	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>
Total	6,750	100				
Toxemia	1,601	24	1,433	21	168	3
Antepartum and Intrapartum Hemorrhage	1,283	19	1,059	16	179	3
Cord Complication or Anomaly	956	14	912	13	42	1
Congenital Malformation	531	8	531	8	..	..
Syphilis	510	8	451	7	59	1
Birth Injury	354	5	354	5	..	..

Hemorrhage, ante- or intrapartum, was the second most frequent complication, occurring in 1,283 of the 6,750 cases (19 per cent of the total). It was indicated as a cause in 1,069 cases (16 per cent).

Cord complications or anomalies (such as compression, prolapse, thrombosis, and so forth) were third in frequency, occurring in 956 of the 6,750 cases (14 per cent of the total). They were indicated as a cause in 914 cases (13 per cent).

Syphilis was recorded as a complication in only 510 of the 6,750 cases (8 per cent of the total) and as a cause in 451 cases. Since serological tests of the blood were made in only two-thirds of the cases, the exact rôle played by syphilis is not known. Ten per cent of the tests made were positive, 4 per cent among white and 28 per cent among Negro women.

Congenital malformation was recorded as a cause in 531 of the 6,750 cases (8 per cent of the total). It is of considerable interest that in four-fifths of the cases the malformation involved the central nervous system.

Birth injury was recorded as a cause in only 354 cases (5 per cent of the total), a figure that does not include congenitally malformed fetuses injured during birth nor those dead before the onset of labor which were reported to have been injured during birth. The fact that postmortem ex-

amination was made on only one-third of the total number of stillbirths studied probably accounts in part for the relatively small number of cases in which birth injury was recorded as a cause of stillbirth.

In order to evaluate properly the rôle played by these conditions and complications as causes of stillbirth it is important to consider them in relation to the time when the fetal death occurred with respect to the onset of labor and to the period of gestation at which stillbirth occurred. Obviously the death of the fetus before labor begins or death of the fetus in the previable period must influence our interpretation of complications as causes.

Table VI shows that the fetus died before labor began in more than half of the cases in which toxemia, hemorrhage, and syphilis were complications of pregnancy and in which congenital malformations were found in the fetus (65, 58, 82, and 60 per cent respectively). On the other hand, in those cases in which cord complications and birth injury was reported fetal death occurred during labor in 61 and 100 per cent of the cases respectively.

Table VII shows for each condition the period of gestation at the time of delivery. The periods of gestation used are the period 20 to 27 weeks, which includes previable infants; the period 28 to 35 weeks, which includes infants

TABLE VI

Time of Fetal Death with Respect to Labor By Condition Associated with Stillbirth

	Total	Died Before Labor		Died During Labor	
		Number	Percent	Number	Percent
Toxemia	1,524	997	65	527	35
Antepartum and Intrapartum Hemorrhage	1,147	616	58	451	42
Cord Complication or Anomaly	956	364	39	592	61
Congenital Malformation	531	302	60	201	40
Syphilis	454	403	82	51	10
Birth Injury	357	...	...	357	100

TABLE VII

Period of Gestation By Condition Associated with Stillbirth

	<i>Total</i>	<i>20-27 Weeks</i>		<i>28-35 Weeks</i>		<i>36 Weeks or Over</i>	
		<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>
Toxemia	1,587	207	13	618	39	762	48
Antepartum and Intrapartum Hemorrhage	1,278	330	26	484	38	464	36
Cord Complication or Anomaly	955	73	8	166	17	716	75
Congenital Malformation	528	53	10	186	35	289	55
Syphilis	506	110	22	204	40	192	38
Birth Injury	376	11	3	29	8	336	89

viable but premature; and the period 36 weeks and more, which includes term and overterm infants. Twenty-six per cent of the stillbirths associated with hemorrhage, 22 per cent with syphilis, and 13 per cent with toxemia occur during the previable period. Nearly two-thirds of the stillbirths associated with syphilis and with hemorrhage, and more than half of those associated with toxemia occurred prior to term. On the other hand, most of the cord complications (75 per cent), congenital malformation (55 per cent), and birth injuries (89 per cent) were found when the fetus was full term.

Perhaps the most important point to consider in this study, aside from the preparation of a new classification of cause of stillbirth, is how many of these 6,750 stillbirths were preventable. Stillbirths caused by syphilis are, of course, the most easily prevented. Serological tests of the blood for syphilis were made in only two-thirds of the cases studied (68 per cent) and in more than a third (36 per cent) of the cases in which a test was made it was not made until the day of delivery or later. More than one-half of the total number of women were, therefore, either not tested or were tested too late to have been treated if they were syphilitic. If all the women who were known to be syphilitic and who gave birth to syphilitic fetuses had been

adequately treated for syphilis throughout pregnancy, 451 stillbirths or a large proportion of them could have been prevented.

Adequate prenatal care might have prevented or reduced the severity of a considerable proportion of the 1,433 cases of toxemia. It is well known that the number of stillbirths occurring in hospitals is increased by the admission of women acutely ill with toxemia and eclampsia who have had no prenatal care or who have had inadequate care. In nearly 200 cases, or 12 per cent of all toxemias, the diagnosis was eclampsia. That this condition can be controlled in a great majority of cases by giving adequate prenatal care is well recognized and many other cases of toxemia also are amenable to treatment. To expect a reduction in the number of stillbirths from this cause seems reasonable.

The prevention of stillbirths due to ante- and intrapartum hemorrhage is more difficult because knowledge of the causes of the underlying conditions is incomplete. However, in a certain proportion of these cases immediate hospitalization and proper treatment would probably be effective, since a large proportion of the cases were recorded as due to premature separation of the placenta, and only somewhat less than one-quarter were cases of placenta previa, a condition obviously not pre-

they are gaining well. In selecting the definition of intermittency to be used, a question arises as to whether some part of the year should be omitted in the use of intermittency, or whether different standards of intermittency should be used for different seasons of the year. It is believed that intermittency should not be determined in June for the following reasons:

1. The closing of the school year commonly makes the weighing date earlier so that the May-June period is likely to be less than a full month. (This was the case in many of the classrooms from which our data were collected.)
2. Since it is near the end of the school year, special attention for poorly growing children is not possible over any continued period.
3. This is a time of year when the seasonal effect upon gain in weight is most keenly felt and has assumed increasing importance as a cause of poor growth.

The greatest difficulty or weakness of any growth index is seasonal fluctuation. However, it is not deemed wise to use other standards for earlier months of the school year because, as is shown by Chart A, the next lower standard, a 2 month intermittency, would give us disproportionately high percentages of children.

We do not yet have enough data to know whether cities or schools with good health programs have less intermittency than others. Groups of a few hundred children studied from other cities show a somewhat higher percentage of cases screened than at Malden.

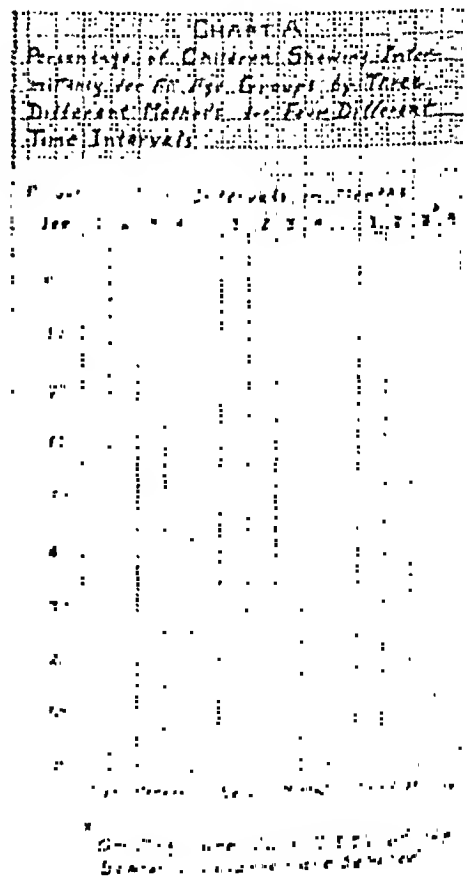
The data here presented touching upon seasonal growth apply only to climates comparable to that of New England. It seems unlikely that it would apply to southern states.

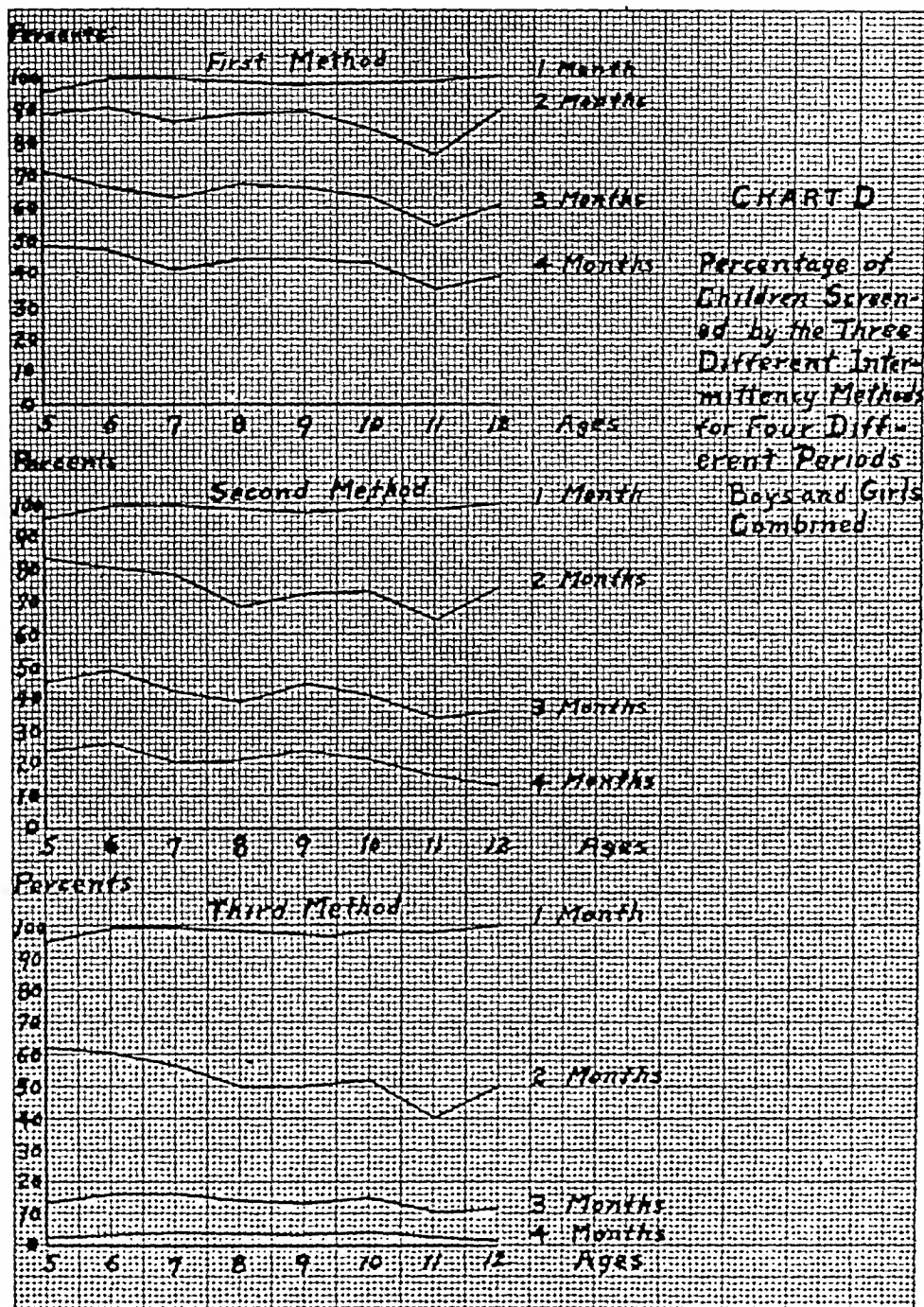
RELATIONSHIPS BETWEEN INTERMITTENCY AND POOR ANNUAL GROWTH

Many school systems give attention to children who have shown poor annual growth. Because of this practice

it seemed practical to explore the relationship between poor growth and intermittency. Poor growth during the school year was determined for the lower decentile of a gain distribution for each age group. Table IV shows the percentage of overlapping between poor growth for the school year and intermittency by the 3 month period, third method, with June weights omitted. This clearly shows that poor growth for the school year and intermittency are far from identical. The amount of overlapping approximates 25 per cent. There are apparently many slowly growing children who do not stop growing for 3 months.

The question arises: Does either intermittency or poor growth for the school year select children on a size basis rather than on a health basis?





We can determine this by comparing the weights of the children selected with the weights of the whole school population. From Table V it can be seen that the poor growth method, like the height-weight-age tables has a tendency to select children who are

naturally small for their age; the intermittency method does not. Intermittency would thus seem to be a definitely better health screen since it is not influenced by the size of the child.

It must be recognized that inter-

TABLE V

Comparison of Average Weights of the Children Screened with the Average Weights of the Whole School Population

Items	Pounds Less or Greater than the Ave. Wt. of All Pupils	
	Sex → Boys	Girls
Pupils Screened by the Proposed Intermittency Method	+ .272	— .500
The 10% of the Pupils Having the Smallest Gain for the School Year	—2.32	—2.25

mittency is not a diagnosis of a specific condition. It selects children who in general have greater need of special attention for one cause or another than the children who are growing well. We are not yet in a position to say that 3 month intermittency cannot occur in a child with relatively good health. We are in a position to say that the use of such a screen is simple and that it secures attention for many children who need it and profit significantly by it.

SUMMARY AND CONCLUSIONS

The most practical public school procedure for screening children who grow poorly during the school year is as follows: Weigh children every month of the school year except June and record intermittency where there is no gain or a loss for each month of 3 successive months.

The number of children screened per school year will approximate 10 per cent while the number of intermittency cases will be in the neighborhood of 12 per cent. In other words, one might expect 2 per cent of the children to be picked up more than once.

Seasonal variation in growth is a factor contributing to a small amount of intermittency in the fall and a

gradually rising amount as the school year progresses. It does not seem wise, however, to use a different standard of intermittency at different seasons.

The evidence presented indicates that poor growth for the school year cannot be substituted for the recommended procedure of measuring intermittency. The identity of the two are not the same, and furthermore the former has the tendency to select children of small skeletal build.

School experience and other studies² indicate that it is worth while for the teacher, the nurse, and school doctor to investigate the cases of children who have stopped growing for long periods—investigating (1) poor habits or recent illness, because of which they may need a modified program, (2) serious physical defects which need correction.

This study shows clearly that if intermittency in growth is to be used as a screen, we need a standard definition. The definition here proposed seems the most practical.

Monthly weighings are necessary to use intermittency as a screen as they are also desirable to get the best educational value from using growth as an incentive toward healthful behavior.

REFERENCES

1. Rogers, J. F. *What Every Teacher Should Know About the Physical Condition of Her Pupils*. Pamphlet 68, Office of Education, Government Printing Office, Washington, D. C., 1936.
2. Turner, C. E., Lytle, Ellen, and Winnemore, Charlotte. Intermittency in Growth as an Index of Health Status. *A.J.P.H.*, XXII, 5 (May), 1932.
3. Franzen, Raymond, and Palmer, George T. The A.C.H. Index of Nutritional Status. *Child Health Bull.*, X, 1 (Jan.), 1934. American Child Health Association, New York.
4. Turner, C. E. Seasonal Fluctuation in Growth with Special Reference to the Clothing Factor. *Res. Quart.*, A.P.E.A. Vol. IV, No. 1 (Mar.), 1933.
5. Porter, W. T. Seasonal Variation in the Growth of Boston School Children. *Am. J. Physiol.*, 52:21, 1920.
6. Baldwin, B. T. *Studies in Child Welfare*. University of Iowa, 1, 1:203, 1921.
7. Gebhart, J. C. *Defective Nutrition and Physical Retardation*. Pedagogical Seminary, 28, 2 (June), 1921.
8. *Rev. Ed. Res.*, American Educational Research

Assoc. Dept. of the National Education Assoc., 1201 16th St., N.W., Washington. Apr., 1933 and 1936.

9. Shuttleworth, F. F. Standards of Development in Terms of Increments. *Child Development*, 5:89 (Mar.), 1934.

10. Significance of Weight as an Index of Health. *Ed. Bull.*, Dept. of Public Instruction of New

Jersey, June, 1930. (See also: *Elementary School J.*, Dept., 1930.)

11. Lucas, W. P., and Pryor, H. B. Physical Measurements and Physiological Processes in Young Children. *J.A.M.A.*, 97:1127-33, 1931.

12. Franzen, Raymond. *Physical Measures of Growth and Nutrition*. Am. Child Health Assoc., 1929.

On Being a Good Egg

THERE'S nothing new in the idea that to get along well in life one must be a "pretty good egg." But the idea that one must start from "a pretty good egg" to get well along in life—that, in the popular vernacular, is something else.

Such a start, according to Professor Raymond Pearl, noted biologist of Johns Hopkins University, is one of the most important factors in the achievement of great longevity. In a lecture on the search for longevity, the fifth of a series delivered to the laity of the New York Academy of Medicine, he said that the rôle of heredity in a long life span has been demonstrated. Reporting his remarks in its issue of February 25, the *New York Times* states that data have been compiled from life tables for parents of very long-lived persons compared to life tables for parents of very short-lived persons: from life tables of children of short-lived parents, mediocre parents in respect of longevity, and long-lived parents: and from the ancestries of nonagenarians and centenarians compared with ordinary folk of mediocre longevity. They show that nonagenarians and centenarians have a much higher proportion of long-lived im-

mediate ancestors than does run-of-mine humanity.

It has been shown also that in the case of persons destined to die of the cardiovascular diseases, the so-called diseases of civilized man, it is possible to demonstrate on the basis of certain medical, genetic and other examinations made when the persons are in a state of health, that groups that will be short-lived and groups that will be long-lived can be distinguished and differentiated years prior to the onset of the diseases that eventually will kill them.

Professor Pearl also presented "the first life tables ever constructed" on the relation between tobacco and longevity. They show that smoking is associated with definite impairment of longevity. As for alcohol, while no measurable effect of the moderate use of alcoholic beverages on longevity can be demonstrated, heavy indulgence definitely and considerably impairs life expectation.

Hard physical labor, whether performed in or out of doors, has no effect upon life expectation up to about the age of forty. After that age, however, such labor definitely and considerably impairs longevity.—*Health News*, N. Y. State Dept. of Health. Mar. 7, 1938.

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

April, 1938

Number 4

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MANCEY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

THE NEED FOR A NATIONAL HEALTH PROGRAM

REPORT OF THE TECHNICAL COMMITTEE ON MEDICAL CARE

AN annual bill of ten thousand million dollars commands attention even in these days when government thinks in billions. The Technical Committee on Medical Care of the President's Interdepartmental Committee to Coördinate Health and Welfare Activities believes that this bill can be cut in two by supplementing existing medical resources and effecting their more even distribution.

In a report just made public the Technical Committee presents clearly and concisely the facts brought out by recent studies of the nation's health, the means available for its protection and the services at hand for the care of the sick. Due tribute is rendered to scientific advances in medicine and in public health procedure. At the same time the committee stresses the lag in practical employment of the new knowledge to provide equal health service to the whole people. For this two causes are given, lack of adequate funds and the need of well trained personnel. A primary objective of the committee's report is to show what can be done, in the light of what is now being done. It reviews the achievements of the past in the various fields of preventive medicine, applauds the results attained in some, but lays emphasis on unmet needs in the two broad classes—maternity, infancy, and childhood on the one hand, and on the other specific causes of sickness, disablement, and death not associated with the risks of early life.

Among approximately 2,000,000 annual births, 75,000 infants are stillborn and 69,000 die in the first month of life, while 17,000 mothers die each year from causes directly connected with childbirth or from intercurrent diseases aggravated by pregnancy. Lack of adequate medical attention is evident in many of these tragedies. In one year a quarter of a million women had no doctor at time of delivery; only 2 of 49 state health officers reported facilities for maternal care in their states as adequate; in urban areas 71 per cent of births occurred in hospitals, and in rural areas 14 per cent; prenatal and child health centers were adequate in but few localities, totally lacking in many; especially

in rural districts nursing service was woefully inadequate. These are samples of unmet maternity needs.

Certain specific inadequacies are similarly listed in provision for preventive and corrective care of children. The use of protective measures against communicable diseases falls far below its possibilities. Less than half the preschool children were immunized against diphtheria in two-thirds of 77 cities and counties recently surveyed. The report criticises severely the ineffectiveness of the health care currently provided for children in the elementary schools. Even less satisfactory is the dental care of our youthful population during its growing years.

Health hazards of later years are also reviewed at length in the report of the committee. Tuberculosis, venereal disease, pneumonia, malaria, chronic diseases of middle and old age, mental afflictions, and industrial risks are discussed and flagrant omissions in existing programs for their prevention and care are indicated.

Following this succinct and well supported statement of the shortcomings of medical care in the United States the report turns to a consideration of causes. Low income groups show notable lack of adequate medical service and at the same time greater percentage of need due to higher morbidity rates. The National Health Survey has shown that families with incomes less than \$1,200 average 8.9 annual days of disability per person, while families with incomes above \$3,000 show only 3.8 days of such illness. Furthermore, 40 per cent of the families investigated were in this low income group. One in every 20 heads of family in the relief group was found unable to work because of chronic disability as contrasted with 1 in 250 heads of family where income was \$3,000 or more. Children in relief families lost 30 per cent more time from school than those in moderate and comfortable circumstances.

The need for medical care, therefore, is plainly greater in relief and low income groups. Actual distribution of medical care to these groups, however, is less than to those who can afford to pay. The myth that the very poor and the rich get about equally good medical care is exploded. This is true only in rare cases where exceptional hospital provision is available for the poor. A carefully prepared table shows that the well-to-do get about $2\frac{1}{2}$ times as much medical care as the poor although the latter's need because of serious illness is $2\frac{1}{4}$ times as great. Further evidence of lack of needed care is furnished by the fact that 47 per cent of the members of families in the \$1,200 or less income group receive no medical, dental, or eye care during a year in contrast to 24 per cent in the \$5,000 group and 14 per cent in the \$10,000 income families. There is no escape from the conclusion that individuals in the low income group, while needing definitely more medical care, actually receive substantially less than those in families comfortably off or wealthy.

Attempts at budgeting for illness by low income families have been frustrated by the unpredictable demands. A family may be stricken in a single year with a staggering load of sickness which its resources are wholly unable to bear. The committee is unanimous in the belief that measures to lighten these unpredictable medical costs are needed by families with low incomes even though such families are ordinarily self-sustaining in other essentials of living. It is also convinced that considerably larger financial support is needed for the medical care of those submerged families without income or with incomes insufficient to provide the economic necessities of life.

Remedies for present inadequacies in medical care of the entire population

are laid down in principle without prescribing a specific plan. Obviously provision must be made for adequate professional personnel. At present there would appear to be approximately enough physicians and private duty nurses to care for the country's need. Some 3 times as many public health nurses as are now available are indicated while the number of dentists could well be doubled without reaching the saturation point.

Hospitals are inadequate both as to number and equipment. It is estimated that 400,000 beds should be added to the 1,100,000 now available.

The critical aspect of the problem, however, lies in the matter of an even distribution of services considering the country as a whole. Physicians show an urban concentration. Rural areas are more in need of dentists and private duty nurses than are cities. But the rural lack of public health nursing reaches a point of scandal in certain localities. In addition to the personal preferences of professional men and women there is a vast economic problem to be met if equal opportunities for medical care are to be supplied all parts of this country. Some plan of subsidy through local taxes, insurance, government grants-in-aid, or a combination of all three, appears clearly indicated.

The committee recognizes that we have at our command tried and tested methods which if put fully to use could accomplish vastly more in the prevention of suffering and the conservation of health. Progress is discouragingly slow under present methods and policies. Better organization of existing resources and further additions to supply evident deficiencies are recommended. "The committee finds there is need and occasion now for the development of a national health program."

The Technical Committee on Medical Care has presented a masterly condensation of the vast store of information on the subject resulting from recent surveys. This has been brought into reasonable and readable form. Conclusions are implied rather than stressed. It leaves no doubt in the mind that the status quo is unsatisfactory. It proposes no revolutionary policy. On the other hand its method is to appraise fairly the merits of procedures now in operation, and at the same time to point out their inadequacies. It advocates essentially the balancing of resources now available by supplying deficiencies where the need is apparent in the various aspects of medical care. It sets forth the highly reasonable doctrine that coördination of these resources is an essential element in their successful employment.

"IT CAN'T BE DONE UNDER OUR LAW"

THE procedure of health administration is to a considerable extent dictated by the law. The legal prescriptions are desirable to the extent that they are necessary for the sake of insuring coöperation of the citizen on one hand, and of protecting him against bureaucratic oppression on the other. But many procedures have been incorporated into the public health law which should have been left to the common sense of the health administrator, or to a small body of qualified persons included in a board of health or an advisory council.

Many of these laws which were thoroughly consistent with the public knowledge of their day, have subsequently become antiquated in that they place unnecessary burdens upon the public, or dictate unnecessary procedures for the health administrator. Some officials, who would like to modernize these laws, hesitate to go before the legislature because, in the endeavor to secure repeal of

obsolete provisions, they run the risk of subjecting the essential provisions to tampering, as has happened in more than one instance.

Among the more antiquated laws are those relating to vital statistics. The model vital statistics law which was drawn up about 1908 performed a very useful function, but it has now become obsolete in a number of respects; and in most of the states, the vital statistics codes today operate as a serious barrier to progress. Any proposal to improve the vital statistics procedure is exceedingly likely to evoke from a number of registrars a statement to the effect that: "Our state could not coöperate in this movement; it is contrary to our state law." And with many, the matter ends there. This mental attitude is unfortunate, and is frequently unjustifiable.

It is, of course, frequently true that in some states the legislative barriers may be insuperable in a practical sense. The attitude of registrars toward their laws, however, is often unnecessarily fatalistic, and the primary purpose of this editorial is to emphasize that the law is not always as rigid as the registrar imagines, and that it should never be assumed that a desirable step cannot be undertaken until the law has been examined in a constructive attitude. This attitude is reflected by the question "Under what provisions of the law might the proposed procedure possibly be *permitted*?" as opposed to the question "What does the law *forbid*?"

If the law be approached in this attitude, it is really remarkable how much can be done, even with an antiquated law. As an example let us take the proposal recently approved by the Association of State Registration Executives that burial permits issued in one state be accepted by cemetery authorities in other states (whence the permit would be relayed for the record and information of the local registrar). Under many of the vital statistics laws, this procedure might be contested on the ground that the state law provides that no body shall be buried within the state unless a proper death certificate has been deposited, and a burial permit obtained. Under a narrow interpretation of the law, the acceptance of foreign burial permits might be barred; but under a liberal one it probably would not. Moreover, there is frequently a provision that the state board of health shall have authority to regulate the transportation of bodies, and under this provision a favorable regulation might be made by the State Board of Health.

Again, in one state the law forbids the issuance of information from birth or death records by the county health officer to persons not authorized. But it was found possible to give out simple age statements on the ground that these did not give out new information, but merely confirmed the statement given by the applicant in his request.

If appeal is made to an attorney-general in such matters, the outcome will depend to a very considerable extent upon the manner in which the question is phrased. A bald request for a decision as to the legality of the proposed move may very readily result in a negative ruling. If, on the other hand, it is pointed out that the proposed move would be for the general welfare, that there is general support and no visible opposition, and if the references to the law include the favorable sections, the Attorney-General will usually be found willing, in his ruling, to give the benefit of any doubt to the progressive cause. This is entirely ethical and proper. No group of legislators can possibly frame a law which foresees all contingencies and social changes, and it is certainly unsound for any public servant to interpret doubtful points in the law to the detriment of the public, whose welfare the law is intended to serve.

A revision of the vital statistics laws of our states is certainly in order. The president of the American Association of State Registration Executives has initiated steps toward reorganizing the model law, but reform will probably be a slow process. In the meantime, before it is concluded that "It can't be done under our law," an effort should be made to see whether the impossibility claimed is as real as it seems.

THE SO-CALLED HUMANE POUND LAW IN CALIFORNIA

THERE is no such thing as a local antivivisection fight, though such movements are staged locally in the various legislatures of the country. One fight is going on now in Washington, D. C., which legally affects only the District of Columbia. What seems to be a more important movement is going on in California in what is called the Humane Pound Law. In 1922, the antivivisectionists carried on a big fight, since which time they have been fairly quiet. The recent movement, beginning in 1937, has been carried out under the initiative which the California law provides. A petition has been circulated which has received the necessary number of signatures, and the matter will go before the voters on the 1938 ballot. While the law provides that dogs and cats shall not be delivered to medical schools from public pounds, it is perfectly plain that this would greatly cripple the use of animals in experimental medicine. The election will not take place until November 8, 1938, but it is not too soon for those interested in scientific medicine to take steps to frustrate the ends of these misled people.

Fortunately, in 1915, the California Society for the Promotion of Medical Research was organized and was the leader in the successful campaign against the "antis" in 1922. It has again entered the field and will doubtless do effective work. We cannot do better than to quote here a resolution adopted by the Western Society of Naturalists:

Resolution adopted, at the request of the California Society for the Promotion of Medical Research, by:

"The Western Society of Naturalists, meeting in Berkeley, California, December 28, 29 and 30, 1937, records its emphatic opposition to any measure such as the proposed 'State Humane Pound Law' which will hinder or curtail animal experimentation as conducted by those fully qualified in biology and medicine. It is the belief of this Society that the present level of health and humane protection of man and animals and further advance in our knowledge of the phenomena of life can be maintained only by constant vigilance and by continued study of the nature of vital processes through the experimental investigation of living animals. Every effort should be made to provide the necessary animals for scientific studies rather than to interfere by the passage of hampering legislation."

While the American Public Health Association as such has not taken any steps in this matter, there is no question that we can assure the California people we are with them heart and soul, and will support them to the best of our ability.

"NINETEEN THIRTY-SEVEN A STAR HEALTH YEAR"

TWO heartening reports have already been made this year.^{1,2} The first is from a selected group of 17,700,000 industrial policy holders for the year 1937. The second covers reports from 39 states of the Union and Hawaii for the first 9 months of 1937. One would expect the selected group of policy

holders to make a better showing than the general population. However, the two reports run very closely parallel and agree essentially. Nineteen thirty-seven was a "year of best records." For the selected group the mortality rate for all causes of death combined was 8.221 per 1,000, or 2.1 per cent better than the figure for 1936. For the entire population the mortality from all causes was 11.1 per 1,000, or 6 per cent lower than that for the same months in 1936. For the insured, 8 causes of death—typhoid fever, scarlet fever, tuberculosis, chronic nephritis, diseases of pregnancy and childbirth, homicides, accidental burns, and railroad accidents showed the lowest mortality rate for all time in the insured group, and the combined rates for all forms of accidental death was lower than ever before. In the general population, whooping cough, poliomyelitis, influenza, cancer, and diabetes showed an increase over 1936. All other causes of death gave rates which were not above those of 1936, and mostly lower. All of the important causes of death except heart disease, pneumonia, and cerebral hemorrhage gave the lowest rate reported for 4 years past.

Particularly striking is the death rate from tuberculosis. The decline which has been noticeable for a number of years, though checked in 1936, has continued during the first 9 months of 1937, being for that period, 50.7 per 100,000, or 2 per cent less than for last year. In the insured group, the mortality from tuberculosis dropped 5.5 per cent. Both among the insured and in the general population the drop in the death rate from tuberculosis is considered as "probably the greatest single achievement in the entire history of the public health movement."

While in the daily press we see frequent warnings that the liquor interests are running wild and encouraging the use of liquor to such an extent that a general movement for the reënactment of prohibition is likely to occur, the Metropolitan Life Insurance Company reports that the death rate from alcohol among its policy holders is at its lowest point since 1921: only 323 deaths among 17,700,000 persons. Of course this is a selected group to begin with, and is under some control. Nevertheless the report is heartening.

Among the general population there has been a continued decline in deaths associated with pregnancy and childbirth, a decline which has been going on for 9 consecutive years. Among the insured there has also been a continued drop in the death rate among children, adolescents, young adults, and even among those of all ages up to 65. For 1937, the death rate was less than one-fourth of that prevailing in 1911, when the Metropolitan Company began its Health and Welfare Program.

In spite of these favorable reports which are most encouraging and prove the value of general health work, there is no disposition to become careless and contented. Indeed campaigns against some of our most important diseases such as influenza, pneumonia, and syphilis are going on with a vigor never before manifested, and there is evidence of the most gratifying response on the part of the public.

REFERENCES

- 1 *Stat. Bull.*, Metropolitan Life Insurance Co., Jan., 1938
- 2 *Pub. Health Rep.*, Feb. 4, 1938.

PUBLIC HEALTH EDUCATION*

An Award for You: An Idea for Others—Again, as in years past, awards will be made for distinctive presentation or interpretation of health and welfare topics. Each year a group of health agencies has won the attention of the judges for attractiveness and effectiveness.

For 1938 the awards will be given for examples of writing: newspaper news releases or feature articles; booklets: letters appealing for funds, answering questions, or replying to criticisms or complaints; reports; articles in official organs of state or local groups, such as clubs, unions, churches, etc.; or other forms of writing to be read, not for broadcasts, plays, etc.

Examples should arrive by April 15, 1938, addressed to Awards Committee, Social Work Publicity Council, 130 E. 22d St., New York, N. Y.

Will the state department and the state association check quickly the sources of good health writing in their states, and try to get samples sent to New York? Likewise we hope that our readers will use the telephone to dig up good examples of the home writing product.

The Office of Public Health Education—Not in years has any single development meant so much to public health education as the inauguration of the Office of Public Health Education in the U. S. Public Health Service. Hence we quote quite fully from *The Health Officer* for Jan., 1938:

Assistant Surgeon General Robert Olesen announced on December 6 that Philip S.

Broughton, Informational Assistant of the Venereal Disease Division, had been assigned by Surgeon General Parran to take charge of the Office of Public Health Education. Mr. Broughton replaces Dr. R. R. Spencer, now Executive Assistant to the National Cancer Institute.

The Office will remain under the direction of Dr. Olesen as a part of the Sanitary Reports and Statistics Division which is, indeed, a division of health information. The primary objectives of the Office of Public Health Education, Dr. Olesen said, will be to demonstrate by precept and example the modern technics of health information. Emphasis will be primarily on the presentation of publications for the layman, attractive not only in content but in format as well. Informality of style, typography, illustration, color, and other means necessary to catch the eye will be developed in these publications. A large part of the work of the Office will be the preparation of materials for other divisions and individuals of the Public Health Service, and may extend to the preparation of exhibits. One of the first objectives of the Sanitary Reports and Statistics Division for this year will be the revision and bringing up to date of previous publications of the Service.

The Health Officer—first publication of the Office of Public Health Education—will continue to be issued on the present basis. Mrs. Elizabeth G. Pritchard, who has been with the Office since its establishment, will act as Editor.

The Health Officer began with a monthly circulation of 1,000. No efforts have been made to increase the circulation, but through requests to the Surgeon General, the mailing list now totals 2,299. The publication is available free of charge, upon request, to the personnel of official and nonofficial public health agencies, social welfare agencies, and personnel of educational departments and institutions, as well as to libraries. Owing to the obvious limitations of a gratis publication, the circulation is limited and regulated by order of the Surgeon General. Upon his approval, representatives of the above mentioned organizations may be placed on the mailing list.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

How Many Public Health Educators Are There?—Who knows the answer? *No one!* But, with a little help from the field, we are about to get the answer.

The Department of Social Work Interpretation, Russell Sage Foundation, has undertaken a census of positions in health and social agencies which are concerned with adult education, interpretation, public relations, or publicity.

A brief questionnaire is being distributed with the coöperation of national agencies with which are affiliated some 10,000 organizations. To secure comprehensive covering of the health education field, readers of these pages are urgently invited to ask for a census blank, and to volunteer to get blanks filled out by other health educators in their cities or states. Please write to Mary Swain Routzahn, Russell Sage Foundation, 130 E. 22d St., New York, N. Y.

Following the census there will be studies of what preparation is needed, and how it may be secured. The several inquiries will cover those who give their whole time, or a considerable share of time under such titles as director or secretary of health education, publicity secretary, editor, staff writer or artist, or who have to do with printed matter, newspaper releases, motion pictures, exhibits, radio, and so on. All but the clerical or office staffs will be included. Geographically the study is limited to the United States.

Even a mere listing of the actual health education workers in itself would be of great interest, and of considerable value.

Health Education De Luxe—At a dollar a throw a large, influential constituency is getting a sound course in highly significant health topics. *Fortune*, 135 East 42d St., New York, N. Y., the dollar a copy magazine.

has presented the following subjects in 1937-1938 to date:

March, 1937: "Cancer, The Great Darkness . . . which engulfs 135,000 lives per year."

November, 1937: "Death Comes to the Average Man . . . via the heart and the arteries, which kill more people than cancer, tuberculosis, nephritis, and pneumonia put together."

January, 1938: "The Accident of Birth." . . . "A \$250,000,000 industry is scrutinized for 'social responsibility' and is found to be in need of some drastic legislation—one way or the other . . . This article is being published in the interests of the health and well-being of persons who are exposed to the products of the birth control industry. It is NOT a discussion of the technics of contraception. It has been read and endorsed by Dr. Morris Fishbein, editor of the *Journal of the A.M.A.*, and by Dr. Paul Nicholas Leech, Secretary of the A.M.A. Council on Pharmacy and Chemistry."

Health Education in Journal, Feb., 1938—References in *American Journal of Public Health*:

"Health Education for the Millions," by Dublin and Calver (pp. 117-122): about health and medicine at New York World's Fair.

In "Syphilis Control in Industry," by Sayers. p. 155 and 156):

Is the campaign against syphilis going to be a nine days' wonder, another thing that "something ought to be done about," or will it be translated into definite programs? . . .

Industry with its compact organization will find the development of a vigorous education program profitable. . . .

Industry might extend that educational campaign into the field of prophylaxis.

In "The Rôle of the Nurse in the Control of Syphilis and Gonorrhea," by Crain (pp. 181 and 182):

The attitude of the worker . . . is fostered by education, and the development of a scientific attitude toward these disease problems. It becomes crystallized as the worker acquires a deep respect for personality, a growing ability to see situations through the eyes of the patient, an aptitude for building on strengths rather than weaknesses, and a profound faith in the powers of persuasive

teaching and the futility of the weapons of fear and force.

It cannot be too strongly emphasized that effective work in syphilis and gonorrhea control requires informed, well trained workers. Education on the job, through institutes, staff education, and summer school courses, must be accepted as a necessity, and improvement and enrichment of courses in training schools should be stimulated.

(See also "Education" on page 182.)

In "A Suggested Program of Control of Amebiasis by Health Departments," by Craig, the program of control includes (page 192)

The education of the public regarding the infection and its importance as a public health problem, by means of printed information, radio talks, etc.

"Journal Policy," an editorial statement in pages 198-199, is of importance to every reader.

School health educators will note the book review on page 221.

"A Selected Public Health Bibliography" (pp. 222-224), as always includes material of interest, as does "News from the Field" (pp. 229-235).

Radio Censors Cancer Education
—As reported in *Bulletin*, American Society for Control of Cancer, 1250 6th Ave., New York, N. Y. (Feb., 1938):

The problem of what may and may not be said about cancer on the radio continues to present difficulties to speakers: Michigan reports through Dr. Henry J. Vandenberg that radio stations in the state have adopted a liberal policy in keeping with the modern tendencies and now permit the mention of womb, rectum, and breasts. From St. Louis a speaker says that she was not permitted to use the words "breasts, uterus, or body openings." It would be valuable for the American Society for the Control of Cancer to receive reports from physicians who have had similar difficulties on what they are not permitted to say over their state radio stations.

"The Health Officer," Dec., 1937
—This monthly is published by U. S. Public Health Service.

"Dr. Nash's Cookery Book" (an English health officer writes a cook book for cutting the cost of good food) . . . Youth fights syphilis (what the Y.M.C.A. is doing) . . . Syphilis control training at Harvard (a full year course) . . . The informative content of education by H. G. Wells (condensed from *Survey Graphic* for Nov., 1937).

"The Health Officer," Jan., 1938
—This issue of the magazine issued by U. S. Public Health Service contains material on health education:

"WPA adult education project issues sample health kits" (sample collections of health material and list of sources supplied for use by state and local adult education groups).

"Public relations for public health" (by Bleeker Marquette, first given at the A.P.H.A. meeting in New York).

"Dental health" (health education for the profession, with announcement of American Assn. of Public Health Dentists).

In "News Briefs" a number of paragraphs on health education.

Hygeia for March, 1938—Published at 535 N. Dearborn St., Chicago, Ill., at 25 cents a copy.

Syphilis . . . How to blow your nose . . . Heart murmurs . . . Eyes and the office worker . . . Nurses in the making (picture scenario of a movie) . . . Tuberculosis and literary genius . . . Infections (little dangers) . . . Leprosy . . . Parasite tricks ("the tramps, loafers, and sharpers of the biologic world") . . . Fatigue and rest . . . The amebas (a doctor's armchair story to Sonny) . . . Health teaching helps by radio and April to June announcements of A.M.A. broadcasts . . . New books on health . . . Questions and Answers.

In "School and Health" by J. Mace Andress:

Building the health curriculum in the high school . . . All in the day's work (Syracuse) . . . Body building and regulating foods (iron and iodine) . . . Seeing is believing (where to get films and other visual material).

WANTED

Reprints about health education; samples of health education printed matter, broadcasts, etc.; copies of

house organs and magazines; catalogues or lists of graphic materials, publications, etc., are invited by Dr. A. Chavarria, Secretaria de Salubridad Publica Y Protection Social, San José, Costa Rica.

BULLETINS OR ORGANS

Second class mail is used for some state and local bulletins, 3d class for others. If those who have been unable to secure second class privileges will report that fact to the editor of this department consideration will be given to what may be done about it.

Young looking and vigorous is *Michigan Public Health* which with the Jan., 1938, issue

... begins its 41st year of continuous publication as the official bulletin of the Michigan Department of Health. It is with pardonable pride that we look back over this lengthy historical panorama of public health activities in Michigan. . . .

This publication is probably one of the oldest continuous bulletins published by a state department of health. First issued in 1898, just 25 years after the creation of the original Michigan State Board of Health, the bulletin continued for 3 years as a monthly publication under the title of "Teachers' Sanitary Bulletin." In 1906 it was changed to a "Public Health Quarterly." The bulletin was again issued on a monthly basis in 1913 and the current Volume XXVI is numbered from that date.

It seems entirely fitting that *Michigan Public Health* should begin the New Year in a new dress. We thus go modern in a revised format. The cover is the work of Miss Pearl Turner, staff artist of the Bureau of Education. The two column type page, the headings, captions and type styles should make for a more effective and pleasing presentation of subject matter. The new format, however, will not lessen our emphasis on content. *Michigan Public Health* will maintain those standards of worth which have made it an important medium of health education in this state for four decades.

Back issues of *Chicago V. D. Bulletin*, Board of Health, Chicago, Ill., quickly go out of print. And

Since it is not possible to supply past issues, it is planned that the 6th month's issue

will carry reprints of some of the matter that has appeared in the previous five, about which most inquiries have been received. The December issue, therefore, will contain a reprint of all matter previously published, in answer to queries concerning the Marriage Law Examination—the Chicago Plan of V. D. Control—the outline of treatment of syphilis—information concerning service offered by the Board of Health—etc.

Quoted from *Health Bulletin*, North Carolina State Board of Health, Raleigh (Feb., 1938):

In this issue of the *Health Bulletin*, we present to our readers who reside outside the state, some of whom live in every state in the Union and in every civilized country in the world from Ongole, India, to Labrador, two comparatively new views of the North Carolina scene in the beginning of the year 1938.

Delaware Health News, State Board, Dover, went red in winter, 1938, number. Something in red on front and back covers, and on alternate pages throughout.

Did we call attention to the fact that *Venereal Disease Information*, after being mimeographed 18 years, now comes in printed form? U. S. Public Health Service, Washington, D. C. 50 cents, a year (send to Supt. of Documents, Washington, D. C.).

Georgia's Health, State Dept. of Public Health, Atlanta, is one of the bulletins or house organs which holds a blank space on the back page upon which is stenciled the addresses to which it is mailed.

In *Arizona Public Health News*, State Board of Health, Phoenix:

"While the contents of the magazine are not copyrighted, credit is requested wherever material is used."

Monthly Bulletin, Indiana Board of Health, Indianapolis, comes in a new dress—a brand new cover with space for a photograph and mention of leading articles.

News Letter, California Tuberculosis Assn., 45 2d St., San Francisco,

appeared in February in printed form.

We are always glad to see the selected copy from various sources which appears in *Bulletin*, Dept. of Health, Lincoln, Neb. But every time we wish that the editor would drop the word "Exchanges" and the odd ornament which appears above it in every issue. The use of "Exchanges" once was common enough in rural newspapers, but many of today's readers will not understand its meaning in the *Bulletin*. And it is not needed.

A book in Chinese is reviewed in *Public Health Reviews*, Ann Arbor, Mich. Oct. 15, 1937. "Health Education in Kindergarten," by Zong Chow. Published by Commercial Press. Under stress of a common editorial convention, the omission of the city of publication, we are left to guess that this book was issued in Shanghai, or was it Hong Kong?

"Browsings" heads a corner in *Monthly Bulletin*, Indiana Division of Public Health, Indianapolis. Both articles and books are briefly mentioned.

"Diabetes" is subject of an entire issue of *Iowa Public Health Bulletin*, Des Moines, Oct.-Dec., 1937.

Diabetes was the central theme of *Commonwealth*, Massachusetts Dept. of Public Health, Boston. Apr.-June, 1937. 78 pages on diabetes; 6 pages on departmental matters.

"A few false advertisements from current publications" are reproduced in miniature on the cover of *Birmingham's Health*, Birmingham, Ala. Feb., 1938. In 5 columns 36 advertisements appear as an introduction to a 5 page presentation of a new food and drug law.

"Know Your Health Department" is a series in *Baltimore Health News*, Baltimore Health Dept., Md. Sketches of staff members, with portraits.

"Public Instruction—One of Today's Big Jobs in Syphilis Control." *Health News*, State Dept. of Health,

Albany. Feb. 14, 1938. A review of progress in terms of New York State.

Six pages of pictures and text were reproduced in *Everybody's Health*, 11 W. Summit Ave., St. Paul, Minn. Jan., 1938. From *Life*, *Look*, and *Literary Digest*, 2 pages each, with a double page spread of Minnesota pictures.

"Timely Articles in Recent Publications," and "Book and Pamphlet Notices" are headings in *Ohio Public Health*, Ohio P.H.A., 1575 Neill Ave., Columbus.

"Your Body and Health," a series of health lectures in Providence, is described in *Health Review*, Rhode Island State Dept. of Health, Providence. Jan. 1, 1938.

DATES AHEAD

Early Diagnosis Campaign is now on, an opportunity for many welfare and health agencies to coöperate with the tuberculosis groups.

This issue will be out in National Negro Health Week. For reports watch for *National Negro Health News*, U. S. Public Health Service, Washington, D. C. *Free*.

A mimeographed health sermon, distributed for use in N. N. Health Week, will be useful where the Week is celebrated locally at a later date. *Free* from U. S. Public Health Service.

U. S. Children's Bureau was established 26 years ago. Worth talking about.

And the start of National Child Labor Committee 34 years ago is worth a word of thanks.

St. George slew the dragon on April 25.

Again, Moving Day, May 1, is a time for certain health suggestions.

And May Day will again be Child Health Day in many communities.

Mother's Day, May 8, will be officially celebrated locally within the week before or week after, by American Legion Posts. Much maternal care

material will appear in newspapers and magazines. For plans and data write to Maternity Center Assn., 1 E. 57th St., New York, N. Y.

National Hospital Day and Birthday of Florence Nightingale come May 12.

June makes the 57th year of Red Cross history in the United States.

MAGAZINE ARTICLES

"Are You Afraid of Syphilis?" by R. E. Lindenberg. *Survey Monthly*, 112 E. 19th St., New York, N. Y. Feb., 1938. 30 cents. Some employment and other back-firing from publicity. In same issue: "Women and Children Last," by Beulah Amidon. Based on the recent Children's Bureau Conference.

"Cold Comfort," by J. D. Ratcliff. *Collier's*. Feb., 26, 1938. "A sneeze from a sick ferret proved the answer to a researcher's prayer."

"A Health Program for Rural America," an interview with Dr. Thomas Parran by Carroll P. Streeter. *Farmer's Wife Magazine*, St. Paul, Minn. March, 1938. 5 cents. 3 cents each for 10 or more.

"Insanity and Insulin," by C. Charles Burlingame. Hope in the use of insulin. . . . "Birth Control and Prosperity," by E. H. Clarke. Economic significance of lowering the birth rate. *Forum*, 570 Lexington Ave., New York, N. Y. Feb., 1938. 35 cents.

"Killed in the Kitchen," by Dr. Louis I. Dublin. *This Week*, the newspaper Sunday magazine distributed in many cities. Nov., 14, 1937.

"The Life of a Medical Student" is a 6 page spread, arranged by Dr. Morris Fishbein from pictures taken in 5 Chicago medical schools. *Look*, Des Moines, Ia. March 15, 1938. 10 cents.

"One Out of Ten Has It," by D. Beres. *New Republic*, 40 E. 49th St.,

New York, N. Y. Sept. 25, 1937. 2 col. review of books by Parran and Becker. A sample of magazine space gained through book reviews.

"Our Arthritis," by Dr. Logan Clendening. *Saturday Evening Post*. Feb. 12, 1938.

A 2 page advertisement of *Ladies' Home Journal* in *Saturday Evening Post* for Jan. 22, 1938, itself was an effective piece of health education.

In color; head and bust of a young woman at left; "Yes! I will take a Wassermann Test" across top of the two pages; right page in text, with "This New Attitude Affects Your Own Business" in a panel.

"When We Choose Health Insurance," by Dr. D. W. Orr, and Jean W. Orr. *Survey Graphic*, 112 E. 19th St., New York, N. Y. March, 1938. 30 cents. Consideration of questions growing out of the series of papers reporting on the actual working of British health insurance.

RADIO

Chicago Board of Health is broadcasting some aspect of syphilis Wednesday and Saturday, 1:35 P.M., over Station WAAF.

Manitoba Dept. of Health and Public Welfare, Winnipeg, started "The Health Reporter" in Oct., to run through May 27, over Stations CJRC and CJGX, Thursday, 8:05 P.M., to 8:15 P.M.

A health reporter will give a summary of the week's news concerning new health ideas and events, as a means of keeping listeners in touch with health matters of current interest.

Manitoba's "Health Review" comes over Stations CKY and CKX every Wednesday, 4:45 to 5:00 P.M. From March 30 to May 11 will run

"The Health Detective in Science," a series of 7 talks to relate how science aids in safeguarding and promoting health and welfare. Three talks on venereal diseases will be included in the spring and summer

program as a continuation of the series given last season.

"Motor vision in safe driving" and "Sight saving." Radio talks in *Sight-Saving Review*, 50 W. 50th St., New York, N. Y. Sept., 1937. 50 cents.

"Our Daily Bread" is a broadcast interview by Dr. James A. Tobey. Copies for use from American Institute of Baking, 9 Rockefeller Plaza, New York, N. Y. Free.

Hartford Tuberculosis and Public Health Society, 488 Main St., broadcasts weekly over WDRC and WTIC.

Baltimore City Health Dept. and Medical and Chirurgical Faculty of Maryland:

Pasteurized pastries prevent disease. . . . All fireworks are dangerous. . . . Helpful use of summer leisure. . . . Keeping well eyes well. . . . Tick-bite fever. . . . Save a life! (from drowning). . . . Death may lurk in the paint can (danger to little children of lead in paint). . . . Water, crystal clear and safe. . . . Banish the common food containers.

Quoted from a radio talk: ". . . to develop immunity for the *oral administration* of . . ." (Our italics.)

The annual *World-Telegram* poll of radio editors asked for opinions as to NBC's refusal to allow General Hugh Johnson to broadcast on venereal diseases. The majority of the editors were against the censorship.

"Catalog of Electrical Transcriptions of Radio Health Plays." New York State Dept. of Health, Albany. Revised. Lists 117 records; plays only; no opening or closing announcements; no mention of New York State Dept. of Health; running about 10 minutes; suggested opening and closing announcements supplied with the records. There are 23 additional records for use in New York State only, because they include the opening and closing announcements.

"Educational Broadcasting Needs Improvement," by Hopkins and McCarthy is a helpful resumé of selected

points made in the Second National Conference on Educational Broadcasting, Chicago, Nov. 29-Dec. 1, 1937. In *Bulletin*, National Tuberculosis Assn., 50 W. 50th St., New York, N. Y. Feb., 1938. Copies may be found in any tuberculosis association office.

A review of Second National Conference on Educational Broadcasting is in *Education by Radio*, 1 Madison Ave., New York, N. Y. Jan., 1938. Free.

Wisconsin Anti-Tuberculosis Assn. conducted its third annual High School Health Radio Contest, closing Dec. 23, 1937, in coöperation with *Milwaukee Journal* station.

We have seen only a few of the expanding collection of books on broadcasting. Yet we doubt that anywhere else will the health broadcaster get as much for so small an investment as in a copy of "Handbook for Amateur Broadcasters," by Pauline Gibson. Scholastic Publications, Chamber of Commerce Bldg., Pittsburgh, Pa. 60 pp. Many illustrations. 50 cents. The Handbook is addressed primarily to high school, college, and little theatre groups. It gives many helpful glimpses behind the scenes in actual broadcasting, together with much of the sort of information and suggestion needed by amateur writers, actors, and producers. It will be helpful in mock broadcasting on the stage or in the classroom; in broadcasting over school loud speaker systems; and in actual station broadcasting.

SCHOOLS AND CHILDREN

Although we announced the discontinuance of School Education Service (partial successor to American Child Health Assn.) it may be well to reprint this request sent out last September:

The School Health Education Service, conducted since 1935 under the auspices of the Joint Committee on Health Problems in Education, has been discontinued.

Will you please take this name from your mailing list and delete any reference to services formerly obtainable from this source from your reference lists and bibliographies.

Readers, please note that incorrect addresses and out of date references are amazingly long lived. Better check reference lists and address files.

"Alcohol in Youth's World," by W. R. Breg. *Journal*, N. E. A., 1201 16th St., N.W., Washington, D. C. Oct., 1937. 25 cents. Something about the problem; something about Allied Youth, at the above address, which seeks to serve the schools in meeting the problem.

An interesting example of interpretation comes from Dr. R. K. Galloway, director, school health service, Public Schools, Nashville, Tenn. Dr. Galloway writes:

The Nashville Council of Parent-Teachers' Associations is publishing this year a bulletin each month pertaining to the city school system, that they are distributing to their respective organizations, and other local interested citizens. The subject of the September number was the "History of Nashville Schools," October's bulletin was on the "Physical Condition of the School Buildings," and the November issue was edited by us on the "School Health Service."

Probably the mimeographing and binding of the Nashville pamphlet was done by students. A sub-heading, or two of them, on every page would have aided the reader.

"Dental Health Education: Can School Children Get It?" This question is asked and answered in Feb., 1938, issue of *Bulletin*, Mich. School Health Assn., Ann Arbor, Mich., even though the address is not given in the *Bulletin*.

"The Problem Solving Approach in Health Teaching" comes from Michigan Joint Committee on Health Education, Haven Hall, Ann Arbor. 25 cents. The Foreword says:

Various methods are used in the school to help children achieve "healthy living."

Some of these methods are more closely related to the needs of boys and girls than others and seem more effective in changing their actual behavior. This bulletin reports a type of activity in which pupils and teachers coöperate in the discovery and handling of the actual health problems of home, school and community.

The American Dental Assn., 212 E. Superior St., Chicago, Ill., is conducting a national dental health poster contest. Local and state contests lead up to the national, including display of posters at the annual meeting of A.D.A. in St. Louis next October. Write the association for details.

"Health of School Children Far and Near," by Sally Lucas Jean, *Public Health Nursing*, New York, N. Y., Dec., 1937. *Junior Red Cross Journal*, Washington, D. C., is doing a fine job on social problems in high schools. "What About the Home Town?" by Leonard W. Mayo, in the Jan., 1938, issue takes up "Haunted Houses." Housing is presented as a story of high school students who study the subject, and try to do something about it.

Probably the biggest circulation among health periodicals is that of *The Health Broadcaster*, a "monthly health newspaper published for pupils, parents, and teachers" by Department of Health Education of Board of Education, 157 E. 67th St., New York, N. Y. In the school year once a month 1,400,000 copies are distributed of this 4 page, 8 by 10 inch, publication.

"The Tuberculin Test in the Schools of San Francisco," by Geiger, Owen and Barret. Dept. of Public Health, San Francisco, Calif. Reprint. Free.

"Safety and Health of the School Child," by Dr. J. F. Rogers. Office of Education. "A self-survey of school conditions and activities." Questions, with practical annotations. Supt. of Documents, Washington, D. C. 29 pp. 10 cents.

"Setting the Stage for Safety," by

H. J. Stack. *Journal of Health and Physical Education*, 311 Maynard St., Ann Arbor, Mich. Sept., 1937. Why do something in high schools; what health and physical education department may do alone, and in correlation with other teaching departments.

"Sources and Uses of Health Material," by Mary P. Connolly. *Journal of Health and Physical Education*, Ann Arbor, Mich. Dec., 1937. 35 cents. Presented at National Education Assn., June, 1937. Based on secondary school group. Three conclusions are quoted:

"The health education teacher must be a sympathetic leader who will encourage the students to study their own situations and to form ideas of their own wants and needs . . . We may learn about the things which are supposed to be good for us, but if they have no relation to our wants, they never become a vital part of us."

"These suggestions may seem to impose a large amount of preparation on the part of the teacher. And they do. However, the vision of the teacher and her preparation for living will convey more to the student than any amount of formal teaching which she may do. If there are advances in health protection, she should know them, and intrigue the interest of the students. They will want to know about them too, if they are tied to their lives."

"... every backyard contains acres of diamonds in one form or another if we only look for them. The same may be said of materials for health education. They lie all around us, waiting to be picked up and used and made a vital part of some student's life."

"Timely Tips on Scout Protection" runs in many issues of *Scouting*, 2 Park Ave., New York, N. Y. Sample free. Files probably available in most communities. A wide range of practical material for use with boys, girls, and young people.

REPORTING

A group of annual reports have been coming to the editor for 10 to 15 or more years. Among them are several which might well be reprintings of earlier issues with a new date on covers

and title pages. A close examination of text and tables is needed to assure the reader that he really is looking at 1938 data.

The latest issues of these reports look like the earlier ones. The reader is not forced to recognize that progress has been made. The appearance of the report suggests the routine reporting of a routine job. It carries no atmosphere of life and growth. The citizen, or the fellow professional, must seek the evidence of growth in the face of seeming somnolence. However, and here's the rub, probably in many states and cities, type, size, paper, etc., etc., are prescribed by a supervising authority, or are subject to a state printing contract. What can be done in the face of all that?

We have some tentative ideas which can be submitted—if any health agency cares to consider them.

The annual report of New York State Dept. of Health (Albany), volume 1, is a 420 page volume, including 16 pages of index. Even that index does not fully satisfy this reader who would like to see some additional cross-references. For example: we do not find under cancer, slides, photographs, exhibits, transparencies, or public health education any reference to the following quoted paragraphs, 2 of 5 paragraphs under the sub-heading, "Photography," in the report of Division of Cancer:

The photographic department has continued its service to the Institute. For the clinical department we have photographed all patients with visible lesions and supplied lantern slides for the staff for lectures as well as reproductions necessary to illustrate the papers written during the year. A good part of our time has been given to the making and arranging of exhibits. This department has supplied transparencies both for lay and medical meetings during the past year. At the present time we have over 900 transparencies in black and white as well as in color.

Our lantern slide library now numbers

over 3,000 slides and it is becoming so large that the available storage space is very rapidly becoming insufficient. The severe handicap with which we have to deal is the lack of sufficient space to store necessary equipment as well as lantern slides, transparencies, negatives and our records. We hope that room can be procured to overcome this condition.

"Middletown First in Group for Health in Cities of the United States," is the heading of a slip for enclosure to 5,100 subscribers by the Orange County (New York) Telephone Company. The slip explained the 1937 appraisal award. The idea originated with the telephone company.

Released for morning papers Jan. 1, 1938, was a 12 page, legal size, review of the city's health presented by Commissioner John L. Rice to Mayor LaGuardia. For some years now the statistical and reporting machinery of the New York City Dept. of Health has been geared to produce preliminary data of considerable significance for immediate public use at the end of the calendar year. Doubtless copies will be supplied upon request.

Dated September, 1937, is a "summary report" of New York City Dept. of Health, 47 printed pages, covering 1934-1936.

"What the Health Department Nurse Does for You." Bureau of Nursing, Dept. of Health, 125 Worth St., New York, N. Y. *Free*. 15 pp.

A nurse's day; tuberculosis comes to a home; citizens of the future; there is a placard on the door; tomorrow's grown-ups; on the safe side; 35 years of work.

FOR EDUCATION OR REFERENCE

Some of the single publications mentioned here need to be asked for promptly before the edition is exhausted.

"An organization to better the standards and administrative practices of all kinds of public activity in housing for families of low and moderate income."

This is National Association of Housing Officials and others, not housing officials, 850 E. 58th St., Chicago, Ill. Please ask for a descriptive pamphlet.

"Child Labor in the Tiff Mines" (Missouri), by C. E. Gibbons. National Child Labor Committee, 419 4th Ave., New York, N. Y. 30 pp. 25 cents.

"Community Provision for the Serum Treatment of Pneumococcic Pneumonias," by a committee of New York Academy of Medicine, 2 E. 103d St., New York, N. Y. *Free*.

"Disease Conditions of the Mouth and Their Relation to Health." American Dental Assn., 212 E. Superior St., Chicago, Ill. 13 pp. 5 cents. Also, "Dentistry and Public Health." Large page, illustrated, popular. 31 pp. 10 cents.

"Help Yourself to Good Teeth" is an envelope size, 4 page folder emphasizing that proper food plus cleanliness plus dental care equals sound teeth. Dept. of Health, New York, N. Y.

"How to Join the 3 Cents-a-Day-Plan for Hospital Care." Tells what, who, and how. Associated Hospital Service, 370 Lexington Ave., New York, N. Y.

"Many a Germ 'Twixt Cup and Lip" is a 4 page folder, reproducing a cover page of *Readers Digest*, with an abstract of an article from *Survey Graphic*. Copies free from Public Health Committee of Cup and Container Institute, 50 W. 50th St., New York, N. Y.

"The Safety and Sanitary Features of Excellent Rooming Houses" is a 4 page folder distributed by Health Service, University of Illinois, Champaign.

"Bibliography on Public Health and Allied Subjects." This is the 24 page classified list of books issued in the last 5 years. *All titles are dated*. Additions to the previous annual list are

indicated. *Free* from American Public Health Assn.

If you wish to check health education (including physical education and recreation) publications issued by Office of Education, Washington, D. C., consult "List of Publications of Office of Education, 1910-1936." No price is given.

"Literature, Posters and Exhibits for Women's Field Army." American Society for Control of Cancer, 1250 6th Ave., New York, N. Y. *Free* list.

"Pictorial Charts and Maps." A 20 page catalogue of pictorial charts, lantern slides, ready-made symbols. Pictorial Statistics, 142 Lexington Ave., New York, N. Y.

"Publications on Play and Recreation." National Recreation Assn., 315 4th Ave., New York, N. Y. *Free*. Classified list of publications, some of which are free.

"Public Health Service Publications." List of publications issued Jan. to June, 1937. U. S. Public Health Service, Washington, D. C. *Free*.

From Nursing Information Bureau, 50 W. 50th St., New York, N. Y.

"Nursing and the Registered Nurse." 54 pp. 10 cents. . . . "Nursing and How to Prepare for It." 21 pp. 5 cents. . . . "Nursing a Profession for the College Graduate." 17 pp. 5 cents.

National Organization for Public Health Nursing, 50 W. 50th St., New York, N. Y., reprints at 10 cents each:

"A Training Course for Volunteers in the Public Health Nursing Field" . . . "A Program for Staff Education: Infant and Preschool Health" . . . "Vacations and Hours of Work for Public Health Nurses in 1937."

RECOGNITION AND INSTRUCTION

A Council on Public Education, Michael M. Davis, Chairman, is one of the 6 Councils of the American Hospital Association, according to 1937 convention action.

Item 13 in the general purposes of the Chicago Hospital Council:

To plan, organize, and carry out a program intended to inform and educate the public regarding hospitals and the intelligent use of the services which they offer.

In the annual meeting of the New Jersey Tuberculosis League a "health education session" was conducted by William A. Doppler of Health Education Service, National Tuberculosis Assn.

The New England Health Education Assn. has planned three series of section meetings to be held in the fall and winter months; school nurses, full-time teachers, and classroom teachers. Address the Secretary, Katherine Hitchcock, Simmons College, Boston, Mass.

Planning window displays for local health and social agencies Evart G. Routzahn spent an afternoon with agency representatives in Greenwich, Conn.

"Taking the Public With You," by Mayhew Derryberry, U. S. Public Health Service, was on the program of the State Health Conference, Charleston, W. Va., Nov. 9, 1937.

PLANNING PUBLIC EDUCATION

"Health Education in Pennsylvania," by A. M. Dewees. *Bulletin*, National Tuberculosis Assn., 50 W. 50th St., New York, N. Y. June, 1937. "How the State Association organizes its program."

"Publicity in Control of Tuberculosis," by J. M. Bridges. *Bulletin*, National Tuberculosis Assn., 50 W. 50th St., New York, N. Y. Reviews use of newspaper and radio, and emphasizes the publicity material ready at hand in tuberculosis work (applies to other health work?).

There is conflict in your relentless battle against tuberculosis; drama in the work of your clinics and your nurses; consequence in the results that may be expected when your research opens up new possibilities of overcoming disease; prominence in the names of the men and women in your respective communities who have given and continue to

give of their time and effort in this worthy cause; oddity in the facts which your clinics reveal; human interest in its broadest sense in the opportunities to serve those who cannot serve themselves; tragedy in the failures to apply the principles which you have been endeavoring to establish in the minds of America; and the sublime satisfaction of a job well done in the notable accomplishments attributed to your organization.

"Sewage Disposal—Its Effects Upon Public Health," by Drs. Cox and Ehlers. Conditions in certain cities which led to active campaigning by the State. *Municipal Sanitation*, 24 W. 40th St., New York, N. Y., Oct., 1937. 15 cents.

PUPPETS—MARIONETTES

Because of local and nearby interest in puppetry we hope that at Kansas City, next October, we will have a demonstration of the educational use of puppets. And why not some puppet examples in the convention Hobby Show?

If interested in puppets, for education or as a hobby, it will be a delight to read and look through Paul McPharlin's "Puppets in America: 1739 to Today." The record really starts before the days of Columbus, with several illustrations of puppet types used by American Indians before the days of white men. A readable review of how puppets came west to America, how they flourished and waned, and flourished again, precedes an intimate personal story of the first American puppetry conference. More than 180 hand puppets, marionettes, rod and shadow puppets are pictured, thus illustrating many types of characters and of puppetry presentation. Published by Paul McPharlin, Birmingham, Mich. \$2.00.

"Making Marionettes," by E. F. Ackley. *American Junior Red Cross News*, Washington, D. C. Oct., 1937. 10 cents. Simple directions for home or school.

"Marionettes Become Health Conscious," by Edith S. Countryman, R.N. *Public Health Nursing*, 50 W. 50th St., New York, N. Y. Aug., 1937. 35 cents. Includes "Infanticipating at the Kelly's" in 3 scenes.

"Marionettes in Parent Education," by J. K. Francis. *Journal of Home Economics*, Mills Bldg., Washington, D. C. Nov., 1937. 30 cents.

Marionettes, the dolls of the adult, can be used successfully to illustrate parent education, with a dialogue written to emphasize interesting points.

The making of marionettes is a hobby requiring skill and patience and has provided an artistic outlet for many persons. There are many helpful books available on the technic of making them. The shaping and balancing of the doll's body appeal to the mechanically minded. Dolls made with wood bodies and jointed with metal screw eyes are sturdy and pliable. Leather strips are often substituted for screw eyes and make a more graceful doll. The completion of a marionette gives one the sense of having created a real actor.

Some puppets are marionettes, as explained in "Puppets in America," by Paul McPharlin:

In modern usage, the name *puppet* is given all theatrical figures animated under human control. Some puppets, worked from above by strings, are called marionettes . . . Hand-puppets, with hollow bodies into which the fingers and wrist are thrust to give movement, run second in popularity. Shadow-figures, black or colored, have great effect, and are not so often seen as they might be. A few producers are experimenting with rod-puppets. Cardboard figures worked with wires from the wings of a toy stage are occasionally revived for living-room entertainment. There are 7 puppet types and their variants, each of which is fascinating in its own way.

With any kind of interest in puppetry you will be interested in "Puppetry Bulletin: 1937-1938." Where to get supplies and equipment; the new books and pamphlets; classification of puppets. Paul McPharlin, Birmingham, Mich. 24 pages. 3 cents.

BOOKS AND REPORTS

Books of Special Interest to Public Health Workers

MAZŮCK P. RAVENEL, M.D.

OUR annual review of books on public health has been favorably received for several years so that it has seemed worth while to go over those published in 1937 and a few in the early months of 1938, and call them once more to the attention of public health workers, physicians, and nurses, and, in fact, to all who are interested in preventive medicine and public health. As in the past, our selections have been based chiefly on books reviewed in this *Journal*. Among others, however, which have been read through the year and from which selections have been made are the *British Medical Journal*, *The Lancet*, and the *Journal of the American Medical Association*. We trust that the present review will meet with the approval of our readers and give some helpful suggestions.

NUTRITION

We have elsewhere pointed out that in England the two great public health movements which have been attracting attention for several years past are housing and nutrition. That housing is attracting attention in this country is shown by the fact that at our Annual Meeting we had a symposium on the Hygiene of Housing; yet few books have come in to us during the current year on either housing or nutrition. It is true that there have been a number of new editions and compilations on nutrition, but no outstanding works have come to our attention. Among these in view of its originality

and its practical bearing, there should be mentioned *Dr. Nash's Cookery Book*, by Elwin H. T. Nash, Simpkin, Marshall, Ltd., an extensive study on providing nutritious foods and preparations at low cost. It is very highly spoken of in England and has had favorable reviews in this country. *Man, Bread and Destiny*, C. C. and S. M. Furnas, Reynal & Hitchcock, is a discussion of the development of civilized man interpreted through his food intake, a fascinating study of nutrition adapted to the layman. Among the notable new editions are *Chemistry of Food and Nutrition*, by Henry C. Sherman, 5th edition, Macmillan, which is an indispensable text, *Vitamins—In Theory and Practice*, by Leslie J. Harris, 2nd edition, Macmillan, presents with a minimum of academic uncertainty a summary of knowledge in this field. It is unexpectedly complete and has an up-to-date wealth of detail. *Dietetics Simplified*, by L. Jean Bogert and Mame T. Porter, Macmillan, is intended primarily for students in home economics. It contains information for the public also, and is authentic, complete, and understandable. *A Laboratory Handbook for Dietetics*, by Mary Swartz Rose, 4th edition, Macmillan, has for many years been a standard textbook for college laboratory classes in dietetics and an invaluable source of reference material for all those concerned with practical problems in dietetics. Much new information is given in this edi-

tion. *Food Technology*, by Samuel C. Prescott and Bernard E. Proctor, McGraw-Hill, is an impressive book designed to aid in training the scientific personnel now required in food industry. Of distinct value to sanitarians and all concerned in the production or control of foods. *The Foundations of Nutrition*, by Mary Swartz Rose, 3rd edition: This text appears in a new format, very attractive. It has been brought up to the minute, will maintain its place as a standard for teaching and reference.

NURSING

The past year has been notable in that the 25th anniversary of the National Organization for Public Health Nursing was celebrated. There have been papers of various kinds, but only one book which we have seen. *Nursing as a Profession*, by Esther Lucile Brown, Russell Sage Foundation, is a reliable and up-to-date source of information for all interested in nursing, giving an insight into the aims, activities, and problems of the nursing profession. *School Nursing: A Contribution to Health Education*, by Mary Ella Chayer, 2nd edition, Putnam, is revised and enlarged, with a chapter on Rural School Nursing, and is practical in every chapter.

HYGIENE AND INDUSTRIAL HYGIENE

Under the general heading of hygiene, industrial hygiene is still demanding much attention, as new chemicals, many of them known to be as possibly injurious to workers are coming more and more into use. The revival of industry in 1937 brought some of these things to the fore. No great work has appeared during the year. Worthy of mention, however, are *Facts and Frauds in Woman's Hygiene*, by Rachel Lynn Palmer and Sarah K. Greenberg, Vanguard, which is especially valuable for lay women. *Modern Principles of Ven-*

tilation and Heating, by T. Bedford, H. K. Lewis & Co., which consists of three lectures under the Heath Clark Bequest at the London School of Hygiene and Tropical Medicine. By an outstanding authority, this work will have a wide reception in this country. *Second Symposium on Silicosis*, by B. E. Bekuechle, Editor, Employers Mutuals, is indispensable to all those who are interested in silicosis. *Personal Hygiene*, by C. E. Turner, Mosby, is a practical text written in interesting style. *Handbook of Hygiene*, by Joseph W. Bigger, Wood, is a 5th edition. The market is flooded with books on hygiene. This is an especially good one, concise and adapted to general use. *A Synopsis of Hygiene*, by W. W. Jameson and G. S. Parkinson, J. A. Churchill, Ltd., is a standard work in its 5th edition.

HEALTH EDUCATION

Health education has been well represented during the year as it generally is. The outstanding books seem to be *Creative Re-education*, by Frederick Paterson, Putnam, which is an "inspiration to all who are attempting to solve the problems of human needs." *The Doctor and the Public*, James Peter Warbasse, Hoeber, is "A timely book, yet not one that will soon be out of date." *A Health Education Workbook*, by Kathleen Wilkinson Wootten, Barnes, is designed for teachers, parents, nurses, and social workers and is an excellent practical text of great value for teachers, school officials, and health workers. *Tuberculosis Education: A Guide for Professional and Lay Workers*, by Elma Rood, Rural School Press, is rich in suggestions for health officers, public health nurses, school administrators, teachers, and community workers. *Adventures in Living Series*, by Thomas D. Wood, Anette M. Phelan, Marion O. Lerrigo, Nina B. Lamkin, and Thurman B.

Rice, Nelson—*Now We Are Growing, Many Ways of Living, Keeping Fit, Blazing the Trail, How We Live*—is an interesting series giving the latest developments in preventive medicine, and at the end of each chapter ingenious suggestions are made for vitalizing health teaching. *Man in a Chemical World*, by A. Cressy Morrison, Scribner, is both cultural and practical. It commemorates the 300th anniversary of the birth of the chemical industry in the United States and is a remarkable and useful story. *The Measurement of Outcomes of Physical Education for College Women*, by Elizabeth Graybeal, University of Minnesota Press, is important as an attempt to evaluate the great efforts now being made in all educational institutions on physical education.

BACTERIOLOGY, PARASITOLOGY AND PATHOLOGY

Perhaps the most notable book under this grouping is *Clinical Parasitology*, by Charles Franklin Craig and Ernest Carroll Faust, Lea & Febiger. It is a new textbook by leading American authorities on tropical medicine and parasitology and is undoubtedly the standard textbook in its field. *Malaria in Europe*, by L. W. Hackett, Oxford University Press, is a valuable contribution to the book-shelf of malariologists, physicians, public health workers, and laymen interested in control of this disease. *Handbook of Microscopical Technique*, by C. E. McClung, 2nd edition, Hoeber, contains many improvements over the first edition and is of great value as a book of reference. *Manual of Public Health Laboratory Practice*, by J. R. Currie and Contributors, Wood, is an excellent book for graduates, but is written for those working under English conditions. *Atlas of Hematology*, by Edwin E. Osgood and Clarice M. Ashworth, W. Stacey, Inc., concerns public

health only in the differential diagnosis of some of the anemias, though is so outstanding as to call for mention here. There is no better work on the subject. *Disinfection and Sterilization*, by Ernest C. McCulloch, Lea & Febiger, is a fine piece of work which will be appreciated by those who find the literature on the subject overwhelming and who are looking for definite knowledge. *Phenomenon of Local Tissue Reactivity and Its Immunological, Pathological and Clinical Significance*, by Gregory Schwartzman, Hoeber, is especially useful to immunologists and clinicians in assembling in one volume the mass of scattered observations on the Schwartzman phenomenon. It constitutes a fine memorial to the high ideals of the author. *Pathology (Clio Medica)*, by E. B. Krumbhaar, Hoeber, is a remarkable, concise and accurate treatment of this important branch of medicine. *Practical Bacteriology, Haematology and Animal Parasitology*, by E. R. Stitt, 9th edition, Blakiston. This has always been the leading book in its line in the English language, if not in any language, and it is hard to speak too highly of it.

SYPHILIS

Because of the campaign which is being waged against syphilis, it is felt that a separate heading should be devoted to it. A notable book is *Shadow on the Land—"Syphilis,"* by Thomas Parran, Reynal & Hitchcock. It bears evidence of the interest in this scourge of mankind awakened in this country by the Surgeon General of the Public Health Service. The book brings out forcibly the important place in our public health program held by syphilis, and points the pathway to control. Two other books on syphilis have appeared. *Syphilis Sive Morbus Humanus: A Rationalization of Yaws So-Called*, by Charles S. Butler, Science Press Printing Co., is largely devoted

to a discussion of the origin of syphilis. *Who Gave the World Syphilis? The Haitian Myth*, by Richmond C. Holcomb, Froben Press, is a critical study of the controversy over the geographical origin of syphilis, well worth reading from every point of view. These books should be read together. There is also *Laboratory Diagnosis of Syphilis*, by Harry Eagle, Foreword by J. Earle Moore, Mosby, which deserves mention.

CANCER

There have been many articles on cancer and everyone knows of the intensive studies being carried out on this disease all over the world. A most useful book is *Some Fundamental Aspects of the Cancer Problem*, edited by Henry B. Ward, Science Press. It is a valuable study giving a good cross-section of cancer research at present.

MATERNAL CARE

The Principles of Antepartum, Intrapartum and Postpartum Care for the Practitioner of Obstetrics, by F. L. Adair, Editor, University of Chicago Press. Though written for the practitioner, this concise booklet will be useful to public health nurses, physicians generally as well as all others whose duties bring them into contact with prospective mothers.

CHILD CARE

Child care in its various aspects has been the subject of many articles, but not many books have come to our notice. *Guide Book for Mothers*, by Allan Roy Dafoe, Julian Messner, Inc., is written in delightful style by the famous doctor who attended at the birth of the Dionne quintuplets and guided their early days to health. *Child Care and Training*, by Marion L. Faegre and John E. Anderson, 4th edition, University of Minnesota Press. The demand for a fourth edition shows the value of this work. The authors

have preserved a judicious balance between the physical, mental, emotional and social factors.

VITAL STATISTICS

Only one book of importance on this subject has come to us, *Statistical Methods in Biology, Medicine, and Psychology*, by C. B. Davenport and Merle P. Ekas, 4th edition, is "recommended to all who require data on statistical methods of the type developed by the Pearsonian school."

HISTORY

Some unusually interesting books on history have appeared. A notable book is that by Sir Arthur Newsholme, *The Last Thirty Years in Public Health: Recollections and Reflections on My Official and Post-Official Life*, George Allen & Unwin, Ltd., which is packed with observations on the history, evolution, and administrative solution of public health problems. Another unusual book is *The Mentally Ill in America: A history of their care and treatment from Colonial Times*, by Albert Deutsch, Doubleday, Doran. This is particularly valuable in view of the increasing recognition of the importance of mental hygiene in our health program. A scholarly review long needed is here supplied. An interesting book of especial value to Americans is *History of County Health Organizations in the United States, 1908-1933*, by John A. Ferrell and Pauline A. Meade, *Public Health Bulletin 222*, Public Health Service, which is a valuable source book for public health administrators and public health students in the United States.

Two unusually interesting autobiographies have appeared. *A Woman Surgeon*, by Rosalie Slaughter Morton, Stokes, is an interesting account of a useful and adventurous life. *Life and Death: The Autobiography of a Surgeon*, by Andrea Majocchi, Knight

Publications, is an unusually fascinating book with reflections on medicine, human nature, religion, superstitions, etc., through all of which the author has maintained his faith in this life and the hereafter. A book which has been reviewed most favorably is *The Mind of Man: The Story of Man's Conquest of Mental Illness*, by Walter Bromberg, Harper, which is highly recommended for historical content, and physicians generally are advised to read it.

GENERAL

It is difficult to put some books in a hard and fast group. A notable and unusual book is *American Medicine: Expert Testimony Out of Court*, by leading doctors and surgeons, the American Foundation, 2 volumes. Few books have led to more discussion of fundamentals than these volumes. We have published a review and a long editorial on the matters brought out, and it remains only to call attention again to the work, which deserves study. *The Environment and Its Effect Upon Man*, by the Harvard School of Public Health, is an effort to correlate a few of the many aspects of this subject and consists of some 19 papers by experts in their respective fields and representing our latest ideas. *Trauma and Disease*, edited by Leopold Brahdly and Samuel Kahn, Lea and Febiger, is an extension of the usual idea of public health which has been needed for many years, and is deserving of a warm welcome. *The Traffic in Health*, by Charles Solomon, Navarre Publishing Company, Inc., is an unusually good discussion of the patent medicine question, covering habit formers, proprietary medicines, cosmetics, etc., concluding with sound advice and a good bibliography. In many ways the most notable work on this general subject. We have put under this general head-

ing two books which might have a heading of their own: *The Psychology of Abnormal People*, by John J. B. Morgan, 3rd edition, Longmans-Green, is a second edition brought up to date of a book that is a leader in its field. *Textbook of Psychiatry*, by Arthur P. Noyes, 2nd edition, Macmillan, is a thorough revision, giving in synoptic form the broad field of general psychology and paying special attention to the field of psychiatric nursing. Under this general heading we are putting also an unusual book, especially valuable, *Principles and Practice of Public Health Dentistry*, by J. A. Salzmann, with chapters by Dr. Struthers, and Dr. McCall, Stratford. This is a book which covers a new field, of particular value in view of the increasing interest in oral hygiene by the medical profession. Deserves a wide circulation among health officers, public health workers, and doctors.

The year has seen also a new edition of *A Practical Medical Dictionary*, Thomas Lathrop Stedman, 13th edition, which celebrates the 25th anniversary of the work, and is excellent from every point of view.

Public Medical Services: A Survey of Tax-supported Medical Care in the United States, by Michael M. Davis, University of Chicago Press, is a useful and compact statement. *First Aid Textbook*, American Red Cross, Blakiston, Revised edition. "Never has the need for first aid been greater than at present. . . ." *Everyday First Aid*, by Walter Frank Cobb, Appleton-Century, is a manual for those who would be prepared—prevention, though the importance of first aid treatment is also well handled. *The Pneumonokonioses (Silicosis) Literature and Laws of 1934*, Book III, by G. G. Davis, E. M. Salmonsens, and J. L. Earlywine, Chicago Medical Press, is important for specialists and libraries.

Preview of Books for Public Health Workers

AT the invitation of the Book Service, publishers have submitted descriptions of books which will be published during 1938. Public health workers will be interested in knowing of these books in preparation. The evaluation in every case is the publisher's own.

Adventures in Respiration

By Yandell Henderson, *Department of Applied Physiology, Yale University.* William Wood & Company. Price probably \$3.00. (In preparation.)

Goes well into the physiology of respiration and deals comprehensively with all phases of asphyxia under various conditions. A book which applies the most recent knowledge of physiology to problems both ancient and very modern, including mining, aviation, automobiles and war.

An Appraisal Form for Local Health Work

By Committee on Administrative Practice, *American Public Health Association.* (In preparation.)

This combines the separate rural and city "measuring rods" for community health previously published. In the first part, a series of simple tabulations provides a means of collecting essential statistics of health conditions as seen against a background of community characteristics. In the second part, public health activities are recorded and appraised. In the third part a list of indices rounds out the picture of community health by briefly summarizing conditions of living, health status of the population and organized health services.

Brief History of Nursing

By Minnie Goodnow, R.N. W. B. Saunders Company.

This book (not to be confused with the author's *Outline of Nursing History*) is an entirely new presentation planned for students in schools where only a limited course is given in nursing history. Each chapter is presented as a unit in order to permit rearrangement or omission as the teacher may elect. Simplified Review Questions are given at the end of the book.

Essentials of Pathology

By Lawrence W. Smith and Edwin S. Gault. D. Appleton-Century Company.

Presents details of pathology necessary for understanding the nature of organic disease. These directly refer to photographs and photomicrographs of diseased tissues. Case records are combined.

Student learns to coördinate his theoretical knowledge with actual clinical problems.

Exercise and Like It

By Dudley B. Reed, *Whittlesey House Health Series.* McGraw-Hill.

A vigorously written, discursive, infectious book on the value of exercises and sports and how to undertake them. Includes chapters on the physiology needed to explain the uses of exercises, also on choosing a recreation, and "when and how much."

Fifty Years a Country Doctor

By William N. McCartney, M.D. E. P. Dutton & Company. \$3.50. (March 10.)

A wise, bluff old medicine man who is ac-

customed to speaking his mind writes a remarkable account of a life-time of work in northern New York in a community comprised of Indians on a reservation, French Canadian habitants, farmers, and other small-town folk.

Food Control: Public Health Aspects

By James H. Shrader, Ph.D., D.P.H., Formerly Director of Scaltest System Laboratories. William Wood & Company. (In preparation.)

A comprehensive work on methods used in food production and control to safeguard public health. Covers methods of processing, microbiological and chemical methods of food analysis used in control of methods of preparation and in inspection by public health officials. Supplies a long-felt need for a comprehensive reference and text on this subject. Suitable for text in schools of public health, for commercial and public health laboratories, for food inspectors.

Fundamentals of Internal Medicine

By Wallace M. Yater. D. Appleton-Century Company.

Concise descriptions of internal diseases coördinated with the underlying pathology and the altered physiology giving the student sufficient material for understanding the fundamental basis of the symptoms and, therefore, a rational background for diagnosis.

This book presents the minimum amount of knowledge the practitioner and student must have at his command to diagnose and treat disease rationally.

Handbook of Social Hygiene

By W. Bayard Long, M.D., and Jacob A. Goldberg, Ph.D. Lea & Febiger. \$4.00.

Produced in contributions by 17 recognized authorities, including besides famous specialists, a hospital director, a director of nursing, and sev-

eral executive officers of public health associations. It is not only a book for the physician but for the public health worker, the social worker, nurses, and others enlisted in the current campaign for social hygiene. This book furnishes exact and scientific knowledge and tells them everything that they need to know.

Health and a Day

By Lord Horder, K.C.V.O., M.D., B.Sc., F.R.C.P. G. P. Putnam's Sons. 213 pp. \$2.50.

Lord Horder writes understandingly of the strain of modern civilization; of the doctor as humanist; of the doctor and public happiness; of old diseases and new; of the duty of the physician to look at his patient as a personality—a complete entity—and not as a mere bundle of physiological and pathological processes.

How to Live

By Irving Fisher, LL.D., and Haven Emerson, M.D. Funk & Wagnalls Company. 20th edition completely revised and rewritten. \$2.00.

Since its publication in 1915, *How to Live* has had a circulation of almost half a million copies. It is the official handbook of the Life Extension Institute, and a textbook in many colleges and schools.

It is written in simple, non-technical language for the general public, giving the findings of the foremost authorities on how to live healthfully in relation to food, drink, clothing, housing, exercise, work, play, rest, sleep, and other related aspects of human life.

I Swear by Apollo (*A Life of Medical Adventure*)

By William E. Aughinbaugh, M.D. Farrar & Rinehart, Inc. \$3.00. (April.)

From boyhood in a small Virginia village after the Civil War and medical student days in Washington, up through

the years of disasters, plagues, floods, panics, to the present day of specialization and knowledge, Dr. Aughinbaugh tells his life story. His work led him to the farthest parts of the world. He was among the first to arrive at the scene of the annihilation of St. Pierre by the eruption of Mt. Pelee—he fought plague in the Red Sea on a pilgrim packed ship, and he studied the ravages of leprosy from Venezuela to China.

Medical Writing: Its Art and Technic

By Morris Fishbein, M.D. American Medical Association. (1938.)

This book represents the gradual evolution of the pamphlets entitled, "Suggestions to Medical Authors," long published by the American Medical Association Press. The various chapters concern the preparation of the manuscript, the technic of medical writing, the development of charts, tables and illustrations, the proper use of words, the selection of a title, the writing of a case report, and many similar topics.

Medical Information for Social Workers

Edited by William M. Champion, M.D., School of Applied Social Sciences, Western Reserve University, Cleveland. William Wood & Company. About 400 pages. Price, about \$3.50. (In preparation.)

A concise book of medical information for public health and all social workers who must possess some understanding of medical matters. Based on a course of lectures given at Western Reserve University, it has been extended and written in collaboration with many leaders in the field. Discusses rather fully diseases with social significance such as tuberculosis, and other diseases more briefly.

Mental Hygiene for Nurses

By Elizabeth Lee Vincent of the Merrill-Palmer School. W. B. Saunders Company.

In this new text the author explains the meaning of mental health and its virtues in relation to nursing practice. She applies the principles of mental hygiene to the personal adjustments of the student, to methods of study and to the nursing care of patients.

Pneumonia and Serum Therapy

By Frederick T. Lord, M.D., and Roderick Hefron, M.D. The Commonwealth Fund. \$1.00. (March.)

This is a completely revised and enlarged edition of *Lobar Pneumonia and Serum Therapy* published in 1936. The 1938 edition contains important new information on dosage and results for Types I, II, V, VII, VIII, and XIV, discusses the use of rabbit serum, sets forth in detail the organization of a pneumonia control program, and brings up to date essential information pertaining to serum therapy of pneumococcus pneumonia.

Pneumonia, With Special Reference to Pneumococcus Lobar Pneumonia

By Roderick Hefron, M.D. The Commonwealth Fund. (In preparation.)

This is an outgrowth of the Pneumonia Study and Service conducted by the Massachusetts Department of Public Health. It is an authenticated account of pneumonia, including the causative organisms, epidemiology, immunity, pathogenesis, measures for prevention, course of the disease, complications and their treatment, diagnosis, prognosis, and treatment.

Psychology Applied to Nursing

By Professor Lawrence A. Arvill of the Massachusetts State Teachers College, and Florence C. Kempf, R.N.,

Assistant Principal and Instructor in Psychology at Massachusetts General Hospital Training School for Nurses. W. B. Saunders Company.

This gives to students a complete presentation of the psychological principles which bear on nursing adjustment. The mental hygiene point of view is maintained throughout. The book incorporates the suggestions included in the Curriculum Guide and is aimed at teaching the student to understand herself, and the personalities of others, especially of her patients.

The Adolescent

By Ada Hart Arlitt, Professor and Head of Department of Child Care and Training, School of Household Administration and Graduate School of Arts and Sciences, University of Cincinnati. McGraw-Hill.

Dr. Arlitt gives the modern concise and readable advice on discipline, emotional control, character training, and planning the day for the older child.

The Care of the Infant and the Young Child

By Harry Lowcnburg, Sr., M.D., Attending Pediatrician to Mt. Sinai Hospital, Philadelphia General Hospital and to the Skin and Cancer Hospital. With the assistance of John C. Williams, M.D., Assistant Pediatrician to the Germantown Hospital, Philadelphia. Whittlesey House Health Series. McGraw-Hill.

The Devil's Candle

By Ruth De Forcst Lamb, author of American Chamber of Horrors, and Chief Educational Officer of the U. S. Food and Drug Administration. Farrar & Rinehart, Inc. \$2.50. (June.)

A constructive and informative book on both the history and the current methods in the protection of the public in the matter of the regulation of foods and drugs.

The Etiology of Trachoma

By Louis A. Julianelle, Ph.D. The Commonwealth Fund. (In preparation.)

Dr. Julianelle reviews the various studies of the etiology of trachoma and correlates with them the findings of the Trachoma Commission established at Washington University several years ago. Some of the observations made at this laboratory have been reported in medical journals, but in this monography they are brought together for the first time and related to existing literature on the subject.

The Truth About Childbirth

By Anthony M. Lindovici. E. P. Dutton & Company. \$2.50. (April.)

The author advances the daring claim that normal childbirth should not be merely painless and uneventful, but actually a fairly safe and pleasurable function. He describes in detail and with scientific documentation the vicious life-habits, the mistaken policies, which today make normal childbirth an impossibility.

Water Supply and Sewerage

By E. W. Steel, Professor of Municipal and Sanitary Engineering, Agricultural and Mechanical College of Texas. McGraw-Hill.

An authoritative, up-to-date treatment combining the subject of water supply, water purification, sewerage and sewage disposal.

Ways to Community Health Education

By Ira V. Hiscock, with the assistance of Mary P. Connolly, Marjorie Delavan, Raymond S. Patterson, Ph.D., and William H. F. Warthen, M.D. The Commonwealth Fund. (In preparation.)

Technics and devices for community health education which have been found practicable by various health de-

partments and voluntary health agencies. The first section considers the methods and vehicles of education in detail with the proper field use of each, while the second section sets forth how these may be correlated to provide an effective health education program for a particular field. Technics to inform specific groups of personal and public health matters and to build public opinion in favor of health services are considered. The book is profusely illustrated.

National Health Survey: Preliminary Reports—*Washington: National Institute of Health, and U. S. Public Health Service, 1937.*

These bulletins are the first of a series of preliminary reports on the results of a nation-wide survey of the extent of illness and the receipt of medical care in relation to a variety of social and economic factors. The work was carried out by the U. S. Public Health Service (Division of Public Health Methods) and the National Institute of Health with the aid of grants from the WPA. The data were collected during the fall and winter months of 1935 to 1936.

The purpose of the investigation was to determine the incidence of disabling illness and accident, and their duration, the prevalence and type of chronic disease and defect, the amount of medical care received, and the relation of these factors to such other factors as income, relief status, employment status, occupation, housing conditions, education, sex, and color.

The reports are based on schedules taken in 84 cities for 740,000 families with 2,660,000 individuals, a number roughly equivalent to 3.7 per cent of the total urban population in 1930. In addition, 36,000 families with 140,000 persons were surveyed in 23 rural counties. The population sample was selected with the greatest care and in

such a way that it might fairly reflect the conditions prevailing in all parts of the United States.

The results of this investigation give us, without doubt, the best picture we have had up to date of the health conditions prevailing in all parts of the country. If it may be assumed that the sample population studied is typical of the entire population, the health status of the American people may be described in a few brief statements.

1. Six million people, 1 out of 20, are unable to work or attend school on each day during the winter months due to illness, injury, or physical impairment. Old people and children are ill more frequently than youth and middle age.

2. Of the 6 million disabled, the acute respiratory diseases account for approximately $1\frac{1}{2}$ million, one-fourth of the total. Chronic diseases are responsible for $2\frac{1}{2}$ million (more than 40 per cent); injuries due to accident for $\frac{1}{2}$ million; acute infectious diseases (mostly children) for 250,000; and acute diseases of the stomach and liver, and appendicitis for about 250,000.

3. During the period of a year 172 out of each 1,000 persons are disabled by illness or accident for 1 week or more. Applied to the whole population this gives 22 million cases of illness disabling for a week or more.

4. In the country as a whole about $\frac{1}{4}$ billion days are lost annually from work or school through illness. On the average this represents 10 days of disability for each person. The average duration of disability for each person per case of illness was 57 days. For those under 15 it was 26, while for those over 65 it was 123. Chronic illness counted for 138 days of disability per case.

5. There is a very significant relation between income status and the frequency of illness. The frequency rate was one and a half times as great for families on relief as it was for families with incomes over \$3,000. The frequency rate declined steadily for successively higher income groups. The greatest differences between income groups appears in the frequency of chronic illness.

6. Disabling illness is also more severe among those of low than of higher economic status. The average case of illness among those on relief was of 63 per cent longer duration than among those with incomes of \$3,000 and over. The greater frequency plus the greater severity of illness in relief families

gives rise to a volume of disability that is 3 times as great as in families of higher income status. The relation between illness and low income is partially revealed in the fact that 5.2 per cent of the heads of relief families reported themselves as not seeking work due to illness. Only 0.4 per cent of family heads in the \$3,000 class were so reported. The extremely high severity of chronic illness in the low income classes is particularly notable. The relief group showed a volume of disability twice that in the highest income group.

7. Families of low income status receive less care by physicians than do those with higher incomes. Thirty per cent of the cases of disabling illness were unattended by physicians in relief families. This figure declined at each income level. In families with incomes over \$3,000 it was 17 per cent. Measured in terms of the number of physicians' visits per case attended there were considerable differences in the volume of care enjoyed at each income level.

8. About 1 per cent of the relief families and 2.5 per cent of non-relief families with incomes less than \$2,000 received the services of a private duty nurse. The figure for those with incomes over \$3,000 was 12 per cent. On the other hand, low income families made considerably more use of the public health nurse. It is doubtful, however, if the public health nurse is an adequate substitute for the private nurse in cases of serious illness.

9. Cases of disabling illness were hospitalized more frequently in relief families than they were among non-relief families of limited incomes (less than \$1,000). Families with incomes of \$3,000 and over enjoyed hospital care more frequently, however, than did relief families. Preliminary analysis, however, seems to indicate that the greater volume of hospital care for relief families prevails only in the larger cities. In the small cities (less than 25,000) relief families received half the volume of hospital care enjoyed by families in the \$3,000 and over class. This fact reflects the greater inadequacy of free hospital service in the smaller cities.

This study deserves the wide interest which it has already attracted from the press and current periodicals. Its results confirm the picture of the nation's health which we have been getting from earlier but more fragmentary and local studies. That there exists an enormous volume of preventable disease, and that

present methods and facilities for meeting the problem are inadequate, seems an inescapable conclusion. No more convincing argument can be presented for the inclusion in our system of social security of an adequate program for health protection than the results of this investigation. Complete reports on the study will be awaited by all those interested in the problem of providing adequate protection against the hazard of illness. C. T. PIHLBLAD

Getting Ready To Be a Mother—
By Carolyn Conant Van Blarcom, R.N. (3rd ed.) New York: Macmillan, 1937. 305 pp. Price, \$2.00.

The third edition of Miss Blarcom's handy manual on prenatal and early infant care follows closely in content and format to the previous editions. However, there has been some rearrangement of the text and considerable new material has been added especially in the way of illustrations and chapters on habit formation. The fact that a new edition of this practical guide has appeared emphasizes the widening recognition of the importance of prenatal care and the desire on the part of parents to obtain the latest and best information available on this subject.

RICHARD A. BOLT

Les Microbes Anaérobies—*By M. Weinberg, R. Nativelle, and A. R. Prévot. Paris: Masson et Cie, 1937.*

No one will doubt that Weinberg and his associates have earned the right to the authorship of this textbook through their assiduous devotion to this group during two decades. The opportunity to review it is especially interesting because I had the good fortune to see, and in a few cases help correct and revise, the galley proofs in Paris in 1936.

Les Microbes Anaérobies is the most complete and accurate treatise upon the anaerobic bacteria that has ever

appeared in print. It is in a single volume of 7 parts, dealing successively (1) with the early discoveries of anaerobic bacteria by Pasteur and the subsequent developments of various technics for studying and cultivating them up to the present; (2) with the pathogenic Gram-positive anaerobic bacilli with central or subterminal spores among which are many of the important disease producing anaerobic microorganisms of man and animals; (3) with the anaerobic bacilli which form terminal spores, among which are *Bacillus tetani*, *Bacillus carnis*, some species not so clearly defined as pathogens, and many which are non-pathogenic; (4) this describes many species of Gram-positive anaerobic bacteria of little or no pathogenic significance. This brings together many supposed species whose present classification is questionable owing to the lack of adequate and critical descriptions, such as "*B. ramosus*," "*B. bifidus*," "*B. lymphophilus*," the "diphtheroid" anaerobes, the chromogenic anaerobes, and the "Streptobacilles," "Leptothrix," and "Streptothrix"; (5) this covers various Gram-negative anaerobic bacteria, "Batonnets," "Fusiformes," again "Leptothrix," "Vibrions et Spirilles," "Bacteroides," and other forms described inadequately; (6) devoted to anaerobic bacilli capable of fermenting complex carbohydrates such as cellulose, starch, and other polysaccharides; and (7) to the anaerobic cocci for whose detailed study Prévot has made himself mostly responsible.

There are appendices on the buccal spirochetes and the broncho-pulmonary anaerobes, on anaerobic bacteria overlooked until after the type was set, and on habitat, as well as a fairly complete bibliography.

The work is fairly well illustrated; many of the photographs of bacteria stained by Levinson to show flagella

are really fine. The paper is better than one finds in some French publications and the printing is good.

It lacks a well organized index and the attempted classification as indicated by the various parts is illogical. One might wish also for a more critical attitude in certain sections, but it seems clear that it was their intent mainly to record in one volume as complete a summary of the literature on the anaerobic bacteria as possible, not to settle the multitudinous problems of identity of species which exist; to compile principally, and to evaluate only where clear-cut indications permitted. In this they have succeeded eminently. *Les Microbes Anaérobies* fills a real need in the field of anaerobic bacteriology and ably supplements and supplants its excellent predecessor, *La Gangrene Gazeuse*, published by Weinberg and Seguin 20 years ago.

IVAN C. HALL

Twenty-five Years of Health Progress—By Louis I. Dublin and Alfred J. Lotka. New York: Metropolitan Life Insurance Co., 1937. 611 p.

When, in 1911, the Metropolitan Life Insurance Company inaugurated its health and welfare program, it placed in charge of the statistical investigations a man whose vision was not confined to the problems and requirements of the day. To say that the development of the philosophy and the perfection of the practice of vital statistics in this country in the last quarter of a century was, in an important degree, determined by the work of Dublin and his gifted associates, is stating a fact of general knowledge.

This work by Dublin and Lotka summarizes and evaluates "Twenty-Five Years of Health Progress" in terms of the experience of the Metropolitan Life Insurance Company and the available comparable material for the general population of the country. The out-

standing qualities are the integrity of statement, logic of deduction, and, what is so often lacking in American scientific work, good literary style. It is particularly gratifying to find few long range prophecies. Reasonably accurate quantitative measurements of morbidity and mortality became possible only recently. Although many diseases have exhibited sustained downward trends, in only very few—smallpox, typhoid fever, diphtheria—were there unquestioned cause-effect consequences. The mortality from scarlet fever, for example, has moved downward almost as rapidly as that from diphtheria. Here one might be tempted to attribute the reduction to public health activities, but the authors, with admirable reserve, merely state the hypothesis "that the causative organisms of the disease have exhibited a diminished virulence in recent years . . . and that we have no assurance that there will not be a reversion to the more virulent type." Similarly, in discussing the downward trend from measles, the authors find it "difficult to account for the marked decline in mortality."

The three introductory chapters: "An Era of Health Progress," "The General Mortality from All Causes," and "The Trend of Longevity through a Quarter Century," form a concentrated but very readable and ample introduction to the detailed discussion of the specific mortality by cause, in which individual chapters are devoted to tuberculosis, influenza and pneumonia, cancer, diabetes, and diseases of the puerperal state. The principal communicable diseases of childhood and the principal cardiovascular-renal diseases are considered as a group as well as individually. A chapter is given to "miscellaneous diseases of special interest," such as typhoid fever, syphilis, pernicious anemia, while the final chapter contains a comprehensive dis-

cussion of the external causes of death—suicide, homicide, and accidents.

The several chapters could be taken as excellent examples of sound objective statistical writing. The treatment of the complex influenza-pneumonia group is particularly excellent. An example of cogent reasoning is the discussion of the marked decline in the death rate from tuberculosis, heart disease, cerebral hemorrhage, and chronic nephritis which followed the influenza pandemic of 1918-1919. "There is," the authors say, "one seemingly obvious explanation," but they do not accept it because

. . . it is not borne out by the facts. It has often been supposed that this decline in death rates was merely a result of the wiping out by the epidemic, in one fell swoop, of a large number of physically impaired persons . . . This supposition . . . is not in harmony with the facts . . . For (1) the death rate from all causes at the older ages did not increase in 1918 as it would have done if there had been a weeding-out process of impaired persons at these ages, (2) the pandemic was notable for its high prevalence among younger people . . . Furthermore, the view that the pandemic was selective in its action against physically inferior persons is contradicted by the fact that there was high fatality among vigorous young men.

The authors then proceed to formulate several likely explanations, stressing, however, that they are all hypothetical.

An appendix to the book gives detailed statistical tables showing the distribution according to sex, race, age, and cause of the more than three million deaths recorded in 1911-1935 among the industrial policy holders of the Metropolitan Life Insurance Company.

For evident reasons, this book cannot become a "best seller," but it should, and one hopes will, be one of the most frequently consulted works in public health literature.

Copies of the book are available to a limited number of libraries and professionally interested people.

J. V. DePORTE

The Psychology of Eating—By Lewis R. Wolberg, M.D. New York: McBride, 1936. 321 pp. Price, \$3.00.

This omnibus of eating traces the dietary lore from the carnivorous cave-man down through the ages to the modern science so venerated by the stream-lined sylphs. On the way it passes through the facts, fads, and fancies which have had their day or which, persisting in part, may be recognized in current practice. From its title the book might be expected to explain why we eat as we do, or even to psychoanalyze aberrant dietary lives. But this theme is abandoned before it is fully developed. The author has used more psychology in writing the book than he has written into it.

While the book spreads over the entire domain of diet and nutrition, it is essentially dedicated to routing obesity. For those on the heavy side, every conceivable psychological stratagem would seem to have been included to meet their every type of resistance to dietary reform. The appeal to instincts, the stir of emotions, and the challenge to reason, all are here. It should reduce the inveterate gourmet or gelatinous backslider to a penitent mood. Thereupon it leads into the road to rehabilitation with its signposts of food values and sample menus.

The book covers much territory; therefore some of it must necessarily be superficial. Then too, its tone has an unevenness which can scarcely be escaped in such a panoramic treatment, for all parts of diet and nutrition do not lend themselves equally well to popularization. But its most noticeable blemishes are a certain lack of coherence at times, and an overindulgence in repetition.

On the whole, the style is agreeable and entertaining. In its exposition of dietetic principles, the book is sound; except for a few inaccuracies, it is likewise faithful to the science of nutrition.

But by all odds the book strikes its highest level in its scattered paragraphs on the psychological basis for food habits, which unfortunately were all too few. If the book's scope had been narrowed, and the reiterations deleted, the space could have been well used toward achieving what the book purports to be—an exposé of the psychology of eating. This variance need not discount what it actually does in its capable and conservative approach to a major dietary problem, obesity. To the diet conscious—and who is not—and particularly to those who are or would be watchful of the waistline, the book offers advice and help as practical yet as palatable as its menus.

H. D. KRUSE

The Management of the Pneumonias—By J. G. M. Bullowa. New York: Oxford University Press, 1937. 508 pp. Price, \$8.50.

Written out of a vastness of experience that alone must command respect, this book covers in a thoroughly comprehensive manner the entire subject of acute pneumonia. The author's experiences over a period of nearly 12 years, as chief of one of the largest pneumonia services in existence, are recorded in great detail with numerous illustrative charts and diagrams. Particularly valuable are Dr. Bullowa's records of age, anatomical form and bacteriology of some 6,000 cases, and his presentation of data concerning the use of antipneumococcus sera, especially in the treatment of the so-called higher types.

If the book deserves any criticism, it must be of the author's tendency to mix statements of soundly established fact with statements of theory without clear distinction. To the reader untrained in the field of pneumonia research, such usage will be found confusing.

The charts and diagrams are meaty in the extreme, but to our point of view

many of them are overly complicated and demanding of too much study.

Because of the wealth of experience it presents, this book must be considered outstanding among the monographs on pneumonia of the present day. It is probably too intricate for the use of the general practitioner, but it cannot be neglected by anyone presuming to a special knowledge of pneumonia. It should be on the reference shelf of every medical library.

EDWARD S. ROGERS

Practical Bacteriology, Haematology and Animal Parasitology—By E. R. Stitt, M.D., Paul W. Clough, M.D., and Mildred C. Clough. Philadelphia: Blakiston, 1938. 961 pp. Price, \$7.00.

It is a work of supererogation to criticise or to praise this book, which has reached its 9th edition. Years ago an English critic said that if a scientist interested in these lines were cast on a desert island and were limited to one book, Stitt is the one which he would select. This opinion, in one form or the other, the reviewer has heard echoed a hundred times, and it is his own opinion also. The preface states that the needs of the man in tropical or remote fields have been borne in mind as well as those who have access to well equipped libraries, and this is true.

The present edition appears in a new format, with two junior editors. It has been considerably revised. The chapter on Filtrable Viruses is practically new. A new chapter on the fungi has been added. The chapter on Immunity and Hypersensitiveness, especially the part dealing with allergy, has been largely rewritten. The greatest revision is found in the part devoted to hematology. Instead of the 67 pages on hematology and the 23 on chemical examinations of the blood, there are now respectively 95 and 56 pages. Some

colored plates have been added in this section.

It is hard to praise this book too highly. The present edition will hold its place with those which have preceded it, as being perhaps the most complete and practical book on the subjects treated on the market. The printing and make-up are good and the illustrations excellent.

MAZÏCK P. RAVENEL

Dr. Nash's Cookery Book—By Elwin H. T. Nash, M.R.C.S., M.R.C.P., Medical Officer of Health, Hounslow, England. London: Simpkin, Marshall, Ltd., 1937. 183 pp. Price, \$.50.

This book describes a research which was undertaken to see how far it was possible to provide a scientifically adequate diet with the requisite amount of first class protein by utilizing the cheap cuts of meat which are seldom used but which from the nutritional standpoint are good. The work was made possible by a grant of £500 from the Carnegie Trustees. Dr. Nash had a staff headed by Miss Hook, a nutrition worker of long experience who had studied dietetics in America as well as in England. He had one other well trained person and his own cook who had been studying Professor Mottram's writings. He personally sampled every dish that was prepared in addition to having a man and a woman from among the unemployed to pass judgment on them. He recognized that monotony of diet must be avoided and that to be useful the dishes must be palatable as well as nutritious.

It is astonishing to note that throughout his study the average price paid for beef was only 6d. per pound and for mutton only 3d. per pound. Most of the utensils used were bought at what we know in this country as 5 and 10 cent stores.

The author lays stress on the utilization of what are usually waste prod-

ucts: bacon scraps left after slicing, biscuit dust accumulating at the bottoms of tins, etc. He mentions one store in his district in which this averages 28 pounds per week, and points out its high nutritive value on account of the fat, sugar, carbohydrates, and proteins which it contains.

There are some 12 pages devoted to General Principles, while the rest of the

book is made up of recipes. We believe this is an unusually useful book. With some change of nomenclature, since the English use terms not generally understood in this country, the book would seem to have a place in providing a wholesome dietary for those who must economize strictly on food bills.

MAZŮČEK P. RAVENEL

BOOKS RECEIVED

- PULMONARY TUBERCULOSIS IN PRACTICE. A MODERN CONCEPTION. By R. C. Wingfield. Baltimore: Wood, 1937. 122 pp. Price, \$2.50.
- POISONS, POTIONS AND PROFITS. The Antidote to Radio Advertising. By Peter Morell. New York: Knight Publishers. 1937. 292 pp. Price, \$2.00.
- HANDBOOK ON SOCIAL HYGIENE. Edited by W. Bayard Long and Jacob A. Goldberg. Philadelphia: Lea & Febiger, 1938. 442 pp. Price, \$4.00.
- THE SELF YOU HAVE TO LIVE WITH. By Winifred Rhoades. Philadelphia: Lippincott, 1938. 182 pp. Price, \$1.75.
- HOW TO BE A CONVINCING TALKER. By J. George Frederick. New York: Business Bourse, 1937. 131 pp. Price, 2 Vols., \$3.50.
- STANDARD BUSINESS ETIQUETTE. By J. George Frederick. New York: Business Bourse, 1937. 188 pp. Price, \$1.75.
- YOUR HEALTH. (List of Radio Programs.) Compiled by W. W. Bauer and P. A. Teschner. Richmond: Johnson Publishing Co., 1937. Booklet. Price, \$24.
- THE PUBLIC ASSISTANCE WORKER. Editor, Russell H. Kurtz. New York: Russell Sage, 1938. 224 pp. Price, \$1.00.
- A BIOLOGICAL APPROACH TO THE PROBLEMS OF ABNORMAL BEHAVIOR. By Milton Harrington. New York: The Science Press, 1938. 459 pp. Price, \$4.00.
- THIRD SYMPOSIUM ON SILICOSIS. Edited by B. E. Kuechle. Wassau, Wis.: Employers Mutuals, 1937. 266 pp. Price, \$3.00.
- STEP BY STEP IN SEX EDUCATION. By Edith Hale Swift. New York: Macmillan, 1938. 207 pp. Price, \$2.00.
- MAN AGAINST HIMSELF. By Karl A. Menninger. New York: Harcourt Brace, 1938. 485 pp. Price, \$3.75.
- PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF ALCOHOL AND THEIR SOCIAL CONSEQUENCES. By Mary Lewis Reed. New York: Lakeside Publishing Co., 1937. 46 pp. Price, \$.15; 100, \$10.00; 500, \$.07½ each.
- PNEUMONIA AND SERUM THERAPY. Rev. ed. By Frederick T. Lord and Roderick Hefron. New York: Commonwealth Fund, 1938. 148 pp. Price, \$1.00.
- LET'S GROW. By Mary L. Hahn and Charles-Edward Amory Winslow. New York: Merrill, 1938. 186 pp. Price, \$.72.
- LET'S STAY WELL. By Mary L. Hahn and Charles-Edward Amory Winslow. New York: Merrill, 1938. 184 pp. Price, \$.72.
- LABORATORY MANUAL. Methods of Analysis for the Butter Industry. Edited by J. C. Fridenberg. Chicago: American Butter Institute, 1937. 48 pp.
- APES, MEN & MORONS. By Earnest A. Hooton. New York: Putnam. 307 pp. Price, \$3.00.
- MENTAL HYGIENE FOR NURSES. By Elizabeth Lee Vincent. Philadelphia: Saunders, 1938. 263 pp. Price, \$2.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Attacking a Ten Billion Dollar Problem—Presenting the need for a national health program, this committee report comments upon the morbidity findings of the recent nation-wide sampling, points out the need for better maternal and child health services, more comprehensive public health administration, a better distribution of medical personnel and institutions, more public health nurses, ending with an emphatic plea for more hospitals in rural centers.

ANON. A National Health Program and Some Proposals Toward Its Design. *J.A.M.A.* 110, 9:656 (Feb. 26), 1938.

Supply and Demand for Medical Services—Suggestions for methods of determining in each county the treatment resources for the care of the medically indigent, and the number of families needing, but lacking medical services.

ANON. Outline for Proposed Plan of Study of Medical Care. *J.A.M.A.* 110, 7:77B (Feb. 12), 1938.

For More Accurate Mortality Reporting — Recommendations are made by the Committee on the Accuracy of Certified Causes of Death of the A.P.H.A. for the revision of the International List designed to omit inaccurate and obsolete terms and to meet needs of better analysis of certain diseases and conditions.

ANON. The Accuracy of Certified Causes of Death. *Pub. Health Rep.* 53, 5:172 (Feb. 4), 1938.

Plans for Better Maternal Hygiene—Reporting the findings of the Conference on Better Care for Mothers

and Babies of the Children's Bureau, which are, or should be, well known to every health worker, mention is made of the two outstanding and equally well organized needs, better obstetrical training for physicians and nurses, and improvement of public health services.

AMIDON, B. Women and Children Last. *Survey.* 74, 2:38 (Feb.), 1938.

Laboratory Diagnosis of Measles—In blood smears from measles cases inclusion bodies may be demonstrated in the white corpuscles, and these bodies may be grown in tissue cultures of blood and of specimens taken in the throat. These two papers will be of interest to other health workers, as well as to pathologists, because of the wide publicity given to the diagnostic possibilities of these and related studies.

BROADHURST, J., *et al.* Measles Inclusion Bodies in Blood and Tissue Cultures and Tissue Cultures of Human Throat Inclusion Bodies. *J. Infect. Dis.* 62, 1:6 (Jan.-Feb.), 1938.

Immunizing Babies — Diphtheria toxoid given at 6 months is as effective as that given at 1 year. Three doses of toxoid amounting to 2 c.c. is as protective as a larger amount, and the intervals between doses are not important.

BENJAMIN, B., *et al.* Results of Schick Test in Five Thousand One Hundred Ninety-five Children Given Injections of Diphtheria Toxoid. *Am. J. Dis. Child.* 55, 1:51 (Jan.), 1938.

Controlling Minor Contagious Diseases—Something about lice, scabies, ringworm, impetigo, and the other items that serve to make the school nurse's life such a merry one.

In 1914, skin diseases were found 42,000 times in New York school children; in 1936, with a much larger enrollment, only 11,000 cases were discovered. A much greater decrease in pediculosis was found, too.

COHEN, S. R. Common Skin Diseases in the Schools. *Pub. Health Nurs.* 30, 2:120 (Feb.), 1938.

Sewage and Garbage Disposal—

Though its subject be far removed from the routine duties and interests of most health workers, this paper on sewage and garbage is so ably written, and quite strangely—considering the topics—often amusing and entertaining, that it is highly recommended to all. A little knowledge of the general subject will hurt none of us.

CORN, M. M. The Disposal of Sewage and Garbage—Related Municipal Functions. *Sewage Works J.* 10, 1:81 (Jan.), 1938.

Life on the Ohio—How 5 million downstream residents drink the insufficiently diluted sewage of 2 million Pittsburghers is graphically told. Acid from mine drainage apparently helps to make the sewage a little less offensive, but the cities below Pittsburgh add their sewage to the mess without benefit of additional mine acids.

CROHURST, H. R. The Pollution Problem in the Ohio River Drainage Basin. *Pub. Health Rep.* 53, 4:121 (Jan. 28), 1938.

Debunking Malnutrition—Physicians differ so greatly in their judgment of nutritional status of children made in routine examinations that such findings are of limited value in determining administrative policies or estimates of malnutrition. Programs to correct faulty habits rather than physical examination campaigns will prove of greater usefulness until valid methods of determining nutritional status are perfected.

DERRYBERRY, M. Reliability of Medical Judgments on Malnutrition. *Pub. Health Rep.* 53, 7:263 (Feb. 18), 1938.

Advice for Epidemiologists—If repeated skin tests for susceptibility to scarlet fever are to be made on the same person, the previous sites should be avoided, for local immunity, as distinguished from general immunity, may be produced by intradermal injections.

DICK, G. F., and DICK, G. H. Local Immunity to Scarlet Fever. *J. Infect. Dis.* 62, 1:83 (Jan.-Feb.), 1938.

Sobering Statistics About the Curability of Active Tuberculosis—

Although the incidence and the mortality rate of tuberculosis have declined, there has been no appreciable change in the ratio of deaths to reported cases in the past 20 years. Sanatorium treatment seems to have had but little effect upon case fatality rates even though segregation of cases has been a factor in limiting the spread of infection.

DROLET, G. J. Present Trend of Case Fatality Rates in Tuberculosis. *Am. Rev. Tuberc.* 37, 2:125 (Feb.), 1938.

All about Vitamins—Introducing an extended series of articles on the vitamins by acknowledged authorities, this paper wisely points out the many things vitamin products will not do, as well as their value in nutrition. The succeeding papers, which promise to be of great value to the health worker who is at all concerned with nutrition, will not be mentioned individually here.

FISHBEIN, M. New Series of Articles on Vitamins. Introduction. *J.A.M.A.* 110, 8:577 (Feb. 19), 1938.

Saratoga, et al. Nota Bene—Evidently British health authorities are boosting the spa in a big way, for here are a half dozen papers on the watering place as an aid to health promotion. As the United States is plentifully supplied with such institutions both inland and on three seaboard, it is to be wondered at that American health

officials have not been called upon to come to their aid too.

HORDER, *et al.* The Spa as a National Asset in the Maintenance of Physical Fitness. *J. Roy. Inst. Pub. Health & Hyg.* 1, 5:274 (Feb.), 1938.

Active Immunization with Meningococcus Toxin — Experience in Missouri CCC Camps with meningococcus toxin used as a prophylactic leads the authors to urge its trial elsewhere. Although 26 cases of epidemic meningitis have occurred in the state camps, none of the immunized group has succumbed.

KUHNS, D. M., *et al.* The Control of Meningococcic Meningitis Epidemics. *J.A.M.A.* 110, 7:484 (Feb. 12), 1938.

A Shoe to Fit Many a Foot—Brief but brilliant, this discussion of selling public interest in public health administration and health practice should be on everyone's "must" list. The last paragraph might well be displayed on every local health department bulletin board.

MARQUETTE, B. Public Relations for Public Health. *Health Officer.* 2, 9:418 (Jan.), 1938.

Preventing Deformities in Polio—From Australia comes word that our orthodox methods of treating poliomyelitis are wrong, for complete rest induces atrophic changes. In the method proposed, passive exercise of affected limbs is carried on even during the pyrexial stage. Local heat is applied, and in a bath, hot and cold sprays are used. The scheme is being tested in England.

MILLS, F. H. Treatment of Acute Poliomyelitis. *Brit. M. J.* Jan. 22, 1938, p. 168.

Motes in Neighbor's Eyes—For those who enjoy a secret sense of superiority, this article about British milk supplies will prove interesting and gratifying reading. It seems that milk producers are grossly underpaid, that

only a tiny part of the country's herds are tuberculin tested, and that compulsory pasteurization is still stoutly resisted. As so large a proportion of market milk samples contain tubercle bacilli, health officials cannot but warn the public, and hence the average per capita consumption, which lies between $\frac{1}{3}$ and $\frac{1}{2}$ pint per day, is not likely soon to be increased.

PRIESTLY, H. The Future of the Milk Supply. *J. Roy. San. Inst.* 88, 8:522 (Feb.), 1938.

Serum Treatment and Bedside Nursing—Stressing the importance of adequate nursing care in pneumonia, this paper is a useful addition to the recent literature devoting so much space to Neufeld typing and serum treatment of certain types of pneumococcus pneumonia.

ROGERS, E. S., and MACCHESNEY, E. H. Public Health Nursing Aspects of Pneumonia Control. *Pub. Health Nurs.* 30, 2:74 (Feb.), 1938.

How to Judge Malnutrition and What To Do about It—Here is something to announce to mothers clubs, parent-teacher associations, etc., when it is desirable to create a sensation. The writer, who is an authority, holds that the child who has a long morning school session from 8 to 1 needs a mid-morning lunch, but the practice of giving milk then is unscientific and often does more harm than good. The child who has his luncheon at 12 should have something to eat after school. When he should have milk, and a great deal more useful advice, will be found in the article.

SMITH, C. H. Malnutrition in Childhood. *Prev. Med.* 7, 11:257 (Feb.), 1938.

Social Hygiene's Main-Spring—Biographical material about William F. Snow, contributed by a large group of his admirers.

Souvenir Number. *J. Social Hyg.* 23, 9:473 (Dec.), 1937.

ASSOCIATION NEWS

SIXTY-SEVENTH ANNUAL MEETING

Kansas City, Missouri

October 25-28, 1938

HEADQUARTERS—MUEHLEBACH HOTEL

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Isaac P. Barrett, M.D., 310½ W. 10 St., Fort Worth, Tex., Assistant Director, Dept. of Public Health and Welfare
J. Douglas Barry, M.D., 934 Paulding St., Peekskill, N. Y., Health Officer
James M. Cameron, M.D., M.P.H., Dept. of Health, Fredericton, N. B., Canada, District Medical Health Officer
Peter Cohen, M.D., Santa Barbara County Health Dept., Santa Maria, Calif., Deputy Health Officer
Leon A. Dickerson, M.D., Fayetteville, W. Va., Fayette County Health Officer
Albert S. Dix, M.D., Scottsboro, Ala., Jackson County Health Officer
Lloyd M. Farner, M.D., C.P.H., City and County Bldg., Provo, Utah, Director, Health District 4, State Board of Health
Charles R. Gillespie, M.D., Indianola, Miss., Director, Sunflower County Health Dept.
Roy W. Harrell, M.D., Box 161, Carbondale, Ill., District Health Supt., State Dept. of Public Health
Floyd I. Hudson, M.D., Sussex County Health Unit, Georgetown, Del., Deputy State Health Officer
Gerard C. Leger, M.D., D.P.H., Buétouche, N. B., Canada, District Medical Health Officer, New Brunswick Dept. of Health
Herbert L. Logan, M.D., Main St., Sussex, N. B., Canada, District Medical Health Officer, New Brunswick Dept. of Health
Lt. Col. Charles L. Maxwell, M.D., Nichols Field, Manila, P. I., Medical Officer, U. S. Army
Howard L. McMartin, M.D., 1316 N. 10th, Boise, Idaho, Director, State Division of Public Health

Harry E. McTyre, 313 W. 37 St., Savannah, Ga., Bullock County Commissioner of Health
Richard Monahan, M.D., D.P.H., Campbellton, N. B., Canada, District Medical Health Officer, New Brunswick Dept. of Health
Roger Murray, M.D., 613 W. 10 St., Wilmington, Del., Executive Secretary, Board of Health
Thomas B. Phinizy, M.D., 501 Greene St., Augusta, Ga., Richmond County Commissioner of Health
Robert H. Riedel, M.D., State Board of Health, Topeka, Kans., Director, Venereal Disease Control, State Board of Health
Saul Ruby, M.D., C.P.H., 3521 Kite St., San Diego, Calif., Assistant to Director of Public Health
Glen T. Smith, M.D., Bannock County Health Unit, Pocatello, Idaho, Medical Director
Charles B. Stephens, M.D., City Health Dept., Topeka, Kans., City Health Officer

Laboratory Section

Beverly C. Booth, 1901 Ryons St., Lincoln, Nebr., Trainee—Sanitarian
Gertrude S. Boyer, 117 S. Boulevard, Oak Park, Ill., Junior Bacteriologist, State Dept. of Public Health
Samuel R. Damon, Ph.D., 517 Dexter Ave., Montgomery, Ala., Director of Laboratories, State Board of Health
Mary M. Dauch, International House, Berkeley, Calif., Laboratory technician—student at present
George G. DeBord, Ph.D., 5336 Colorado Ave., N.W., Washington, D. C., Associate Bacteriologist, District of Columbia Health Dept.

- Harry M. Eudowe, 1175 Chapel St., New Haven, Conn., Director, Eudowe Clinical Laboratory
- Warren C. Eveland, Box 561, Juneau, Alaska, Director, Division of Laboratories, Territorial Dept. of Health
- Herman A. Fisher, 420 Sixth Ave. N., Nashville, Tenn., Laboratory technician, State Dept. of Public Health
- Dorothy E. Ford, Cheswold, Del., Laboratory technician, State Board of Health
- Kenneth Goodner, Ph.D., Rockefeller Inst. for Medical Research, York Ave. & 66 St., New York, N. Y., Bacteriologist
- Eleonore Gottlieb, 4735 Lewis Place, St. Louis, Mo., Bacteriologist, City Health Dept.
- Thomas H. Grainger, Jr., Sharp & Dohme, Glenolden, Pa., Research Assistant, Technical Div.
- Margaret W. Higginbotham, D.Sc., Minneapolis Dept. of Health, University Campus, Minneapolis, Minn., Bacteriologist
- William F. Hutson, State Dept. of Public Health, Nashville, Tenn., Bacteriologist, Div. of Laboratories
- Vivian Jurst, 105 W. 72 St., New York, N. Y., Bacteriologist, Pyridium Corp.
- George Kucker, 14 Race St., Hillside, N. J., Medical Technologist and Chemist, Elizabeth Bio-Chemical Laboratory
- Edward C. Link, Pathological Institute, Memphis, Tenn., Bacteriologist
- Margaret B. Lindsay, 117 S. Boulevard, Oak Park, Ill., Junior Bacteriologist, State Dept. of Public Health
- Harvard C. Luke, 148 Pierce Ave., Twin Falls, Idaho, Laboratory technician, South Central District Health Unit
- James M. Neill, Ph.D., 1300 York Ave., New York, N. Y., Research in Bacteriology, Cornell University Medical College
- Ruth D. Northey, Yale Univ. Dept. of Health, New Haven, Conn., Laboratory Assistant
- Gordon R. Reeves, State Board of Health, Jackson, Miss., Bacteriologist, State Hygienic Laboratory
- Rita A. Robinson, R.F.D. 2, Box 312, Oklahoma City, Okla., Bacteriologist, Central Laboratory, State Dept. of Health
- Doris L. Roddan, San Joaquin General Hospital, French Camp, Calif., Assistant Laboratory technician
- Charles Schwartz, Ph.D., 5630 Hobart St., Pittsburgh, Pa., Research Chemist, Calgon, Inc.
- Carol C. Schweiss, International House, Berkeley, Calif., Laboratory technician—student at present
- Orton K. Stark, Ph.D., Miami University, Oxford, O., Assistant Professor of Bacteriology
- Frank H. Stubbs, 401-8 St., Albany, Ga., Director, Branch Laboratory, State Dept. of Health
- Earl J. Sunkes, Dr.P.H., State Dept. of Health, Atlanta, Ga., Assistant Director of Laboratories
- Wheelan D. Sutliff, M.D., William H. Park Laboratory, Foot of E. 15 St., New York, N. Y., Assistant Director, Pneumonia Control
- Elizabeth Wilson, Michigan Dept. of Health Laboratories, Lansing, Mich., Junior Bacteriologist
- Ben M. Zakariasen, Rm. 552, State Office Bldg., St. Paul, Minn., Chief Chemist, Dept. of Agriculture, Dairy and Food

Vital Statistics Section

- Edward P. Conaty, 80 Dover St., Providence, R. I., Fiscal Officer, State Dept. of Public Health
- Robert G. Webster, Rm. 162, Hall of Justice, Los Angeles, Calif., Chief, Div. of Vital Records, Los Angeles County Health Dept.

Public Health Engineering Section

- Hayse H. Black, 1605 S. Douglas Ave., Springfield, Ill., Assistant Sanitary Engineer, State Dept. of Public Health
- Edward S. Brown, Jr., C.E., 13 Balch St., Hanover, N. H., Instructor in Sanitary Engineering, Thayer School
- Charles G. Caldwell, 3525 Life Sciences Bldg., Berkeley, Calif., Student at present—District Sanitarian in New Mexico
- Ellsworth F. Clements, Box 429, Juneau, Alaska, Sanitarian, Territorial Dept. of Health
- Charles E. Gotta, 454 E. Second St., Caspian, Mich., Sanitarian, Iron County Health Dept.
- Herbert A. Jewett, 727 W. Arden Ave., Glendale, Calif., Chief, Div. of Water and Sewage, Los Angeles County Health Dept.
- John N. Johnson, State Board of Health, Raleigh, N. C., District Sanitarian
- Silvio D. Mastroianni, 728 W. 5 St., Reno, Nev., Student
- Noel McKeehan, Rm. 9, Court House, Phoenix, Ariz., Sanitarian, Maricopa County Health Unit
- Curtis E. Moutrey, Koy County Public Health Dept., Newkirk, Okla., Sanitarian
- Walter A. Reiman, State Board of Health, Little Rock, Ark., Assistant Sanitary Engineer
- Paul E. Seuser, C.E., 1412 Smith Tower, Seattle, Wash., Assistant Public Health Engineer, State Dept. of Health

Lawrence R. Tabor, P. O. Box 676, Thomasville, Ga., Sanitary Engineer, Thomas County Health Dept.

George A. Warren, Broward County Health Dept., Ft. Lauderdale, Fla., Sanitary Officer

James M. Welsh, Division of Public Health, Boise, Idaho, Senior Sanitarian

William W. White, 812 W. First St., Reno, Nev., State Sanitary Engineer

Industrial Hygiene Section

Lewis B. Case, 18721 Gainsborough, Detroit, Mich., Chemist, Research Laboratories Div., General Motors

Arthur L. Nichols, Jr., University of Kansas, Lawrence, Kans., Industrial Hygiene Technologist, State Board of Health

Food and Nutrition Section

William M. Hale, M.D., Food & Drug Admr., Dept. of Agriculture, Washington, D. C., Medical Officer

William S. Fultz, County Court House, Olympia, Wash., Sanitarian, Thurston-Mason-Olympia Health District

Stewart Slater, 89-69-215 St., Queens Village, L. I., N. Y., Inspector of Food, New York City Dept. of Health

Child Hygiene Section

Frank P. Bertram, D.D.S., State Dept. of Health, Oklahoma City, Okla., Director, Division of Dental Hygiene

Sonia Cheifetz, M.D., Box 315, Juneau, Alaska, Acting Director of Maternal and Child Health, Territorial Dept. of Health

Grace M. Connors, State Board of Health, Madison, Wis., Maternal and Child Health Demonstration Nurse

Antony Triolo, M.D., 3503 Walbrook Ave., Baltimore, Md., Student at present

Public Health Education Section

Charles M. Bonniwell, Box 443, North Platte, Nebr., Sanitarian, District Health Unit 3

Philip S. Broughton, 1445-44 St. N.W., Washington, D. C., Charge of Office of Public Health Education, U. S. Public Health Service

Mabel M. Brown, R.N., 94 Maple St., Malden, Mass., Director of Health, Reading Public Schools

Ira L. Ferguson, University of Minnesota, Minneapolis, Minn., Graduate Student

Charles A. Freck, 411 N. 10 St., St. Louis, Mo., Executive Secretary, Missouri Tuberculosis Assn.

Mina B. Glasier, M.D., Bloomington, Wis., Member, State Board of Health

Theresa D. McGee, 216 Maryland Ave. N.E.,

Washington, D. C., Health Secretary, Council of Social Agencies

Public Health Nursing Section

Thelma M. Akana, P. O. Box 2255, Honolulu, T. H., Administrative Assistant, Bureau of Public Health Nursing, Territorial Board of Health

Alice M. Anderson, Box 1245, Fort Peck, Mont., Maternity Demonstration Nurse, State Board of Health

Jennette H. Banker, 3903 Longview Ave., Phoenix, Ariz., Public Health Nurse, Phoenix Union High School

Sarah R. Bernard, 822 N. 5 St., Phoenix, Ariz., Public Health Nurse, Maricopa County

Nettie B. Bubbs, 7 Cardinal Ave., Albany, N. Y., Supervising Public Health Nurse, Div. of Public Health Nursing, State Dept. of Health

Frances A. Denham, R.N., Rutherford Health Dept., Murfreesboro, Tenn., Assistant Supervisor, Nursing Division

Veronica Donnelly, 18 Union St., Ononta, N. Y., District State Supervising Nurse, State Dept. of Health

Jean P. Fach, R.N., Albany, Ore., Linn County Public Health Nurse

Goldie S. Carlyon, Wickenburg, Ariz., Staff Nurse, County Health Unit

Burdena Hyer, P. O. Box 1101, Douglas, Ariz., School Nurse, Cochise County Health Service

E. Belle Jackson, Butler, Ala., Choctaw County Nurse

Marie A. Jacobson, 1401 Truxillo St., Houston, Tex., Instructor in Public Health Nursing, University of Houston

Zoe LaForge, P. O. Box 2591, Birmingham, Ala., Director, Division of Rural Child Hygiene and Public Health Nursing, Jefferson County Board of Health

Mary W. Matthews, P. O. Box 1656, Miami, Fla., District Supervisor of Nurses, State Board of Health

Alma McClintock, R.N., 6940 Church Ave., Ben Avon, Pa., State Nurse, State Dept. of Health

Eleanor Morgan, 615 W. 150 St., New York, N. Y., Nurse, New York City Dept. of Health

Jeannette E. Potter, 203 N. 26 St., Billings, Mont., Rural Public Health Nurse, State Board of Health

Juanita Ross, 411 Cleveland St., Durham, N. C., Staff Nurse, Dept. of Health

Naomi R. Stevens, Rt. 2, Box 120, Glendale, Ariz., School Nurse

Catherine Webster, 12 Fordonia Bldg., Reno,

Nev., State Advisory Nurse, Division of Maternal and Child Health
 Blanche M. Werner, P. O. Box 533, Bisbee, Ariz., Supervising Nurse, Cochise County Health Unit

Epidemiology Section

Albert L. Eisner, M.D., CCC Camp, Rupert, Idaho, Camp Surgeon
 Lloyd Florio, M.D., M.P.H., Calhoun County Health Dept., Marshall, Mich., Associate Director
 Felipe Lopez Sierra, 615 N. Wolfe St., Baltimore, Md., Student at present
 Lester M. Petrie, M.D., 304 Wilton Drive, Decatur, Ga., Assistant Epidemiologist, State Dept. of Public Health

Unaffiliated

Demetrio Castillo, B, M.D., 1621 N. Broadway, Baltimore, Md., Student at present
 Alexander A. Robertson, Health Dept., New-

ton, Mass., Chief Sanitary Officer and Milk Inspector
 Oscar D. Schwartz, M.D., 820 N. Broadway, Baltimore, Md., Student
 E. Irving Vredenburg, 502 Pacific Commerce Bldg., Los Angeles, Calif., Assistant National Director, Health and Safety Service, Boy Scouts of America
 Ray L. Wheeler, 9 Rose St., Cobleskill, N. Y., New York State School of Agriculture and Home Economics

DECEASED MEMBERS

Edgar R. Hiatt, M.D., Troy, O., Elected Member 1927
 O. C. Pickel, Ph.D., Salt Lake City, Utah, Elected Member 1926
 William F. Roberts, M.D., St. John, N. B., Canada, Elected Member 1936
 John N. Ryan, M.D., Passaic, N. J., Elected Member 1915

ROYAL SANITARY INSTITUTE

THE Royal Sanitary Institute will meet in Portsmouth, England, July 11-16.

The Executive Secretary of the A.P.H.A. desires to know of any Fellows of the Association who plan to be in England during this period.

CONFERENCE ON THE HEMOLYTIC STREPTOCOCCI

THE Coördinating Committee of the Laboratory Section, under the Chairmanship of Lieutenant-Colonel A. Parker Hitchens, recently sponsored a conference to discuss methods for the identification, study, and taxonomy of the hemolytic streptococci. The 19 persons in attendance were representative of organizations and agencies interested in the subject. The discussions are reported in 26 mimeographed pages. A limited number of copies of the

report are available upon application to the Executive Office.

PUBLICATIONS NEEDED

THE Association stock of these issues of the *Journal* is almost depleted:

January, 1937
 February, 1937
 January, 1938

If any members can spare copies of these numbers, the Executive Office will much appreciate it if they will kindly send them to headquarters, at 50 West 50th Street, New York, N. Y.

CORRECTION

ON page 147 of the February *Journal* (Sanitary Aspects of Air Conditioning, by C. P. Yaglou), reference 11 should be "March, 1938," instead of "March, 1937."

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS WANTED

HEALTH OFFICERS

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins, and 14 years' public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, M.D., C.P.H.; 2 years' experience as district health officer; anxious to do venereal disease control work or epidemiology. A345

Physician, M.D., Northwestern University; Dr.P.H., Yale; will consider appointment in general administration, infant welfare or epidemiology. A300

Physician, M.D., Johns Hopkins; public health course at Michigan; experienced in school and city health work, will consider an administrative post in eastern United States. A354

Trained administrator, A.B., M.D., with background of laboratory and research; formerly assistant health commissioner large city. Familiar with all lines. Available short notice. A295

Physician, M.D., University of Maryland; C.P.H., Johns Hopkins; broad experience in county public health administration, will consider opening of better class. A346

Physician, M.D., Tufts; C.P.H., Johns Hopkins; administrative experience large city health department, will consider position as health officer or epidemiologist. A362

CHILD HYGIENE

Experienced physician, M.D. and Ph.D., University of Minnesota; specially qualified in maternal and child hygiene, directing state and local programs; will consider position of better sort. A238

Woman physician, M.D., Yale; Dr.P.H., Yale; experienced in pediatrics and adminis-

tration of state bureau, will consider attractive opening. A348

MISCELLANEOUS

Experienced teacher, B.S., Massachusetts Institute of Technology; graduate courses, Harvard School of Public Health; wishes position or will consider statistical or health education opportunity. M353

Certified teacher of Hygiene and Health Education; man, age 35, M.S. in Education, also graduate studies at Teachers College, Columbia and Massachusetts Institute of Technology, seeks appointment to teach or supervise effective program in Personal and Community Hygiene. M360

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. M352

Young man, Sc.D., Johns Hopkins; experience in public health and research bacteriology; will consider position in public health work or university teaching. L312

Young man, at present college teacher of hygiene and physical education and experienced in university medical service, desires position as executive in public or private health organization. M357

Young woman, Ph.D., Yale University, experienced in the field of bacteriology and immunology, will consider a position in health organization, education or the administrative field. M324

Pediatrician: Graduate of Syracuse University; internships and postgraduate work in pediatrics in United States and Europe; teacher in large eastern medical college; author of textbook on infant nutrition; considerable experience in city health department in infant welfare and child health, juvenile tuberculosis, and epidemiology. Will consider position in teaching, or in infant welfare, child health, or other public health work. M361

NEWS FROM THE FIELD

ANTI-SYPHILIS COMMITTEE

MORE than 1,200 men and women representing business and the professions are aligned with General John J. Pershing, chairman of the National Anti-Syphilis Committee of the American Social Hygiene Association, in the \$500,000 fund campaign for the Association's program against syphilis, especially among youth, and the conditions which favor its spread.

These men and women are serving either on the national committee which numbers 271 or one of the 16 state committees in the 5 areas of the campaign. Through the activity and endorsement of these leaders, General Pershing's committee has been enabled to show a total of almost \$150,000 in gifts and pledges.

With several weeks yet remaining for the appeal, indications are that the required sum will be obtained.

INSPECTION OF DIAGNOSTIC LABORATORIES

A PLAN to inspect and appraise the public and private diagnostic laboratories in Illinois has been announced by the State Department of Health. The immediate object is to improve and standardize laboratory tests for syphilis.

Each laboratory that volunteers to participate in the plan will be inspected at intervals by a representative of the department. Assistance will be offered when needed, and standard antigen for making blood tests for syphilis will be provided by the department. Certificates of approval will be issued to each laboratory maintaining the required technical and professional standards and a register of all approved laboratories will be kept. There are about 225 of these laboratories in the state.

THE HENRY ROSE CARTER MEMORIAL LABORATORY

ON February 8, 1938, the Henry Rose Carter Memorial Laboratory was dedicated at Savannah, Georgia, in honor of the late Assistant Surgeon General, Henry Rose Carter (1853-1925), of the United States Public Health Service. The land, building and equipment were made possible through funds authorized by the city administration. Construction was effected through the WPA, according to the plan of the Director, Senior Surgeon T. H. D. Griffiths, who was assisted by Mr. Kinyon, of the City Health Department. The laboratory was presented to the United States Public Health Service and will be used for malarial research.

It is a fitting memorial to one of the world's greatest sanitarians and investigators of malaria and yellow fever, much of whose work may have been forgotten by the present generation.

Summarizing the outstanding contributions of Dr. Carter to public health and sanitation, they are: (1) the determination of the correct incubation period of yellow fever; (2) the determination of the extrinsic incubation of that disease; (3) establishment of its place of origin in Africa; and (4) his introduction of successful malaria control measures in the United States. Many of his papers on malaria control were published in early volumes of the *Southern Medical Journal*.

It is fitting that a testimonial to his achievements should be in the form of a malarial research laboratory, since his views have been accepted internationally and his preventive methods adopted throughout the world. Savannah is to be congratulated upon fostering this institution. Many young

Americans today are ignorant of or may consider lightly the great service which the Army and Navy medical corps have rendered the world in sanitating uninhabitable lands and making them safe for human beings. It is appropriate that it be kept in mind by a tribute of this type to an illustrious name.—*Southern Med. J.*, Mar., 1938.

"COOPERATIVE HEALTH"

COOPERATIVE HEALTH will be the title of a magazine to be launched this spring as the official monthly publication of the Bureau of Coöperative Medicine, Coöperative League of the United States. Farm, labor, medical and social welfare leaders will serve as advisers on the Board of Consultants for the journal.

Michael M. Davis, Ph.D., Chairman of the Committee on Research and Medical Economics, will head the Board. Representatives from the social welfare and medical fields include: Edith M. Gates, National Y.W.C.A. health education secretary, Dr. C. Rufus Rorem, Dr. C.-E. A. Winslow, Dr. Henry Sigerist, Mrs. Miriam Steep, and Carl Malmberg, editor of *Health and Hygiene*, who will act as consulting editor. Editorial policy of the new magazine will be directed toward coordinating the many steps toward coöperative medicine now being taken in this country, according to Martin W. Brown, secretary of the bureau.

PNEUMONIA SERA

ACCORDING to Dr. Edward S. Godfrey, Jr., New York State Commissioner of Health, "unfortunate" and "premature" publicity giving the impression that the use of rabbit sera in the treatment of pneumonia will soon result in the availability of sera highly effective against all of the 50 different types of the dis-

ease, is without scientifically accepted supporting evidence.

However, Dr. Godfrey said, it must be understood that his criticism is directed against "premature use of a new product" and not in any way intended to discredit its ultimate usefulness or the present value of anti-pneumococcus horse sera, now recognized as of great value and, in fact, provided for physicians by the state.

Dr. Godfrey also made public a resolution of the state's advisory committee on pneumonia control, urging against jeopardizing the future of anti-pneumococcus rabbit serum as a practical method of pneumonia treatment by its "premature generalized use."

CAIRO LEPROSY CONFERENCE

AMONG the distinguished physicians representing the United States in the Fourth International Leprosy Conference in Cairo, Egypt, were: H. E. Hasseltine, M.D., Victor G. Heiser, M.D., James A. Doull, M.D., and George M. Saunders, M.D.

N.O.P.H.N. INSTITUTES

THE National Organization for Public Health Nursing has planned a series of Institutes for the Saturday and Sunday just prior to the Biennial Convention to be held in Kansas City, Mo., April 24-29. The following subjects will be covered at individual institutes:

Records and Statistics, Syphilis and Gonorrhea, Maternity, School Nursing, Tuberculosis, and Business and Office Administration.

Attendance at each institute is limited. Registrations stating name, address, positions, N.O.P.H.N. membership, name of institute, and enclosing registration fee of \$3.00, should reach the N.O.P.H.N. office, 50 West 50th Street, New York, N. Y., before April 10.

INTERNATIONAL HEALTH BROADCAST

LEADING British and American physicians, 6,000 miles apart, will confer via the radio on a great menace to child health, rheumatic heart disease. This conference, one of the first international broadcasts on health problems, will be heard over the National Broadcasting Company, WEAf and the Red Network, on Monday evening, May 2, at seven thirty o'clock Eastern Daylight Saving Time. Arranged by the American Heart Association, New York City, the conference-broadcast will observe National Child Health Day.

Lord Thomas Jeeves Horder, Physician-in-ordinary to the King of England, will open the conference, speaking from London. Dr. Homer F. Swift of the Rockefeller Institute, New York City, and Dr. T. Duckett Jones of the House of the Good Samaritan, Boston, will then speak from Atlantic City where they will be attending the convention of the American Society for Clinical Investigation. Dr. William J. Kerr, President of the American Heart Association, will take up the discussion from San Francisco.

COLORADO PUBLIC HEALTH ASSOCIATION

IN March, Platt W. Covington, M.D., of Salt Lake City, President of the Western Branch, American Public Health Association, met with the Council of Allied Health and Welfare Associations of Denver to discuss the creation of a Colorado State Public Health Association. It was decided to organize a Colorado Public Health Association from the Allied Association and a constitution was adopted by those present who agreed to stimulate membership in the state and national organization from among those professionally engaged in public health work in Colorado.

INDIAN SERVICE CEREMONIES

DR. W. W. Peter, Medical Director of the Navajo-Hopi Areas, has called attention to the fact that the new United States Indian Service base hospital of 130 beds, costing \$450,000, will be dedicated at Ft. Defiance, Ariz., on Monday, June 20. Three days of clinics will follow.

An invitation is extended to physicians and public health workers who might route their return by Ft. Defiance over the Santa Fe Railroad or by transcontinental highway 66, after attending the annual meetings of the Western Branch of the Association in Portland and the American Medical Association in San Francisco. Dr. Peter, whose address is Window Rock, Ariz., offers to arrange tours over the 25,000 square mile reservation, visiting other hospitals and points of scenic and public health interest after the dedication and clinic days.

NATIONAL NEGRO HEALTH WEEK

THE Twenty-fourth annual observance of National Negro Health Week will occur April 3 to April 10, with a special objective for the year, "The Family Doctor's Opportunity in Community Health Service."

As in previous years, the plans for Negro Health Week are under the direction of a national committee co-operating with the United States Public Health Service, Washington. Roscoe C. Brown, D.D.S., is in charge.

TUBERCULOSIS CAMPAIGN IN CUBA

THE Cuban Government has recently allotted \$1,000,000 from its lottery funds for a campaign against tuberculosis, the *Health Officer* reports. Clinics are to be established throughout the country for examinations, which will be carried out on every citizen. Edgar Mayer, M.D., and Morton

C. Kahn, Ph.D., of New York, recently visited the island to help establish the first clinics. With Wilson G. Smillie, M.D., New York, they will return periodically to advise on the work, it is said. L'Esperanza Hospital near Havana has been renovated for the care of tuberculous patients and a new hospital is being built near Trinidad.

HEART DISEASE LEADS IN INSURANCE CLAIMS

FOR the 14th year in succession, more money was paid out for deaths from organic heart disease than for any other cause of death. The huge sum so disbursed last year (\$29,500,000, in round numbers) represents 17 per cent, or more than one-sixth of the total death claim payments of the company. The per cent of the total paid out year by year for deaths from cardiac conditions has been increasing almost continuously. Both physicians and public health workers know that a good share of the heart disease cases which result fatally year after year could be prevented or postponed, namely those of chronic endocarditis, which have their origin, very often, in the infectious diseases of childhood, in acute rheumatism and in syphilis. . . .

In addition to the death claim disbursements on account of cardiac diseases, close to \$21,000,000 was paid out in 1937 for 2 nearly related conditions, chronic nephritis and cerebral hemorrhage. These diseases often occur concurrently with heart disease. Thus the 4 principal cardiovascular-renal impairments combined were responsible for about \$40 out of every \$100 disbursed for all death claims last year.

Cancer ranked second in importance among all the causes of death and accounted for nearly 12 per cent of all the money paid out in death claims. Ten years ago it was responsible for a little

more than 9 per cent. It is interesting to note also that in 1927 the company disbursed more money on account of tuberculosis than on account of cancer, whereas in 1937 disbursements for cancer totaled two and one-third times those for tuberculosis. . . .

Tuberculosis ranked eighth, with claim payments of \$8,720,000. Tuberculosis is an outstanding example of a disease that is yielding steadily to an efficiently organized and administered movement for control. . . . Within that period (10 years) the per cent paid out has dropped from 10.3 to 5.0, and the actual sum disbursed in 1937 was lower than in 1927 by nearly \$1,700,000, despite the fact that lives of policy holders exposed to risk have increased within these years by more than 4,000,000. . . . —*Stat. Bull.*, Metropolitan Life Ins. Co. Feb., 1938.

MEDAL AWARDED DR. SCHICK

THE medal of the New York Academy of Medicine has been awarded to Dr. Bela Schick, who originated the Schick Test 25 years ago.

Dr. Schick, who is a native of Hungary, is a graduate of the Medical School at Graz, Austria. Since 1923 he has been Pediatrician-in-chief at Mt. Sinai Hospital. He is also Clinical Professor for Diseases of Children at Columbia University.

GEORGIA COUNTY UNITS

FIVE new county departments of health were recently opened in Georgia, and two additional counties will be opened as units as soon as qualified commissioners of health can be secured.

New Commissioners have been appointed as follows:

- Dr. Henry T. Adkins—Blacky County
- Dr. Harry E. McIntyre—Bullach County
- Dr. Roy L. Johnson—Coffee County
- Dr. Johnnie L. Gollinger—Dade County
- Dr. John L. Deane—Walton County

MISSISSIPPI HEALTH LIBRARY

THE Mississippi State Board of Health, Jackson, Miss., announces a gift of over 1,200 volumes to the Medical and Public Health Library, from Dr. W. A. Evans, of Aberdeen, Miss., for many years Health Officer of Chicago.

The Mississippi State Board of Health library was started about 2 years ago, with 5,000 volumes.

NATIONAL HEALTH COUNCIL OFFICERS

NEW officers of the National Health Council, New York, N. Y., for 1938, are announced as follows:

President—Professor Ira V. Hiscock, Yale University, New Haven, Conn.

Vice-President—Dr. Walter Clarke, A.S.H.A., New York, N. Y.

Secretary—Dorothy Deming, N.O.P.H.N., New York, N. Y.

Treasurer—Frederick Osborn, American Eugenics Society, New York, N. Y.

Re-elected to the Board of Directors for a three-year term are: Donald B. Armstrong, M.D., whose term as President has just expired; Professor M. A. Bigelow, Kendall Emerson, M.D., Livingston Farrand, M.D., Homer Folks, Stanley H. Osborn, M.D., and William F. Snow, M.D. Dr. H. N. Marvin was elected delegate at large.

NEW OFFICERS OF NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

AT its last annual meeting on February 19, 1938, the Northern California Public Health Association elected the following officers:

President—Ida May Stevens, San Francisco

President-Elect—Louis Olsen, Palo Alto

Vice-President—Dr. H. E. Bingham, Woodland

Treasurer—Helen Hartley, Stockton

Secretary—Dr. I. O. Church, Oakland

Representative to the Regional Board of the Western Branch, A.P.H.A.—Dr. H. L. Wynns, San Francisco

Representative on A.P.H.A. Governing Council—Dr. Fred T. Foard, San Francisco

SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION ELECTS NEW OFFICERS

NEW officers of the Southern California Public Health Association, elected at its last annual meeting on January 31, 1938, are as follows:

President—Dr. G. E. McDonald, Long Beach

President-Elect—Dr. Alex M. Lesem, San Diego

First Vice-President—Dr. Wilton L. Halverson, Pasadena

Second Vice-President—Dr. C. Morley Sellery, Los Angeles

Secretary-Treasurer—Dr. R. L. Kaufman, Whittier

INDUSTRIAL PHYSICIANS MEETING

THE meeting of the American Association of Industrial Physicians and Surgeons will be held concurrently with the Midwest Conference on Occupational Diseases, at the Palmer House, Chicago, Ill., June 6-9.

PERSONALS

Central States

DR. CHARLES ALBERT ARNESON, of Bismarck, N. D., has been named Health Officer of Bismarck.

CHARLES H. P. G. BENNING, M.D., C.P.H.,* of Peoria, Ill., has been appointed District Health Officer of Royal Oak, Mich., a position he held prior to his appointment as School Physician in Peoria.

BENJAMIN LIEBERMAN, M.D.,† has been appointed head of the School Hygiene Division of the Milwaukee Department of Health, to succeed the late GEORGE P. BARTH, M.D.*

DR. JOSEPH F. MICHAELS, of Loogootee, Ind., has been appointed Health Officer of Marion County.

DR. ERNEST V. NOLT, of Columbia City, Ind., has been appointed Health Officer of Whitley County.

* Fellow A.P.H.A.

† Member A.P.H.A.

DR. JOHN R. PENCE, of Minot, N. D., has been appointed Health Officer of Ward County.

HOWARD J. SHAUGHNESSY, PH.D.,† formerly with the Department of Bacteriology and Public Health of the University of Illinois College of Medicine, has been appointed Associate Professor of Bacteriology and Public Health in the University of Colorado, Denver. He succeeds SEVERANCE BURRAGE, PH.D.,* who has retired.

Eastern States

LEAH M. BLAISDELL, R.N.,* formerly Educational Supervisor, Division of Public Health Nursing, New York State Health Department, has joined the staff of the Henry Street Visiting Nurse Service, New York, N. Y., as Educational Director.

DR. EUGENE N. COZZOLINO has been appointed Health Officer of West Haven, succeeding the late DR. CHARLES E. KAUFMAN.†

JOHN S. CUNNINGHAM, M.D.,† formerly Epidemiologist in the Connecticut State Department of Health, has been appointed District Health Officer in charge of Livingston, Monroe, and Wayne Counties, New York.

J. J. GOLUB, M.D.,† Executive Director of the Hospital for Joint Diseases of New York, has been appointed by Governor Herbert H. Lehman to the Saratoga Springs [N. Y.] Authority.

DR. HOWARD R. HANSELL has been appointed Health Officer of Sharon, Conn., during the absence of DR. JEROME S. CHAFFEL.†

MARY R. LAKEMAN, M.D.,* of Boston, Mass., has been appointed North-eastern Regional Director for the Women's Field Army of the Ameri-

can Society for the Control of Cancer. Dr. Lakeman retired December 1, 1937, from the Massachusetts Department of Public Health, with which she had been associated for 20 years in child and adult hygiene work.

E. V. MCCOLLUM, PH.D.,* Professor of Biochemistry and head of the Department at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md., received the degree of Doctor of Laws at a special convocation recently at the University of Manitoba.

DR. WINFRED OVERHOLSER has been appointed Superintendent of St. Elizabeths Hospital, Washington, D. C.

DR. ERNEST R. PENDLETON has been appointed Health Officer of Granby, Conn.

J. H. SHRADER, PH.D.,* has been elected President of the Metropolitan Dairy Technology Society, New York, N. Y.

DR. A. STAMPAR, of the staff of the Health Committee, League of Nations, Geneva, and formerly the Director of Health of Yugoslavia, recently delivered a DeLamar lecture on hygiene at Johns Hopkins on the subject. "International Health Work."

Southern States

ASA BARNES, M.D.,† has been transferred by the Missouri State Health Department from District No. 3 (Kennett, Mo.), to open up a new district, District No. 6, composed of 14 counties in southwest Missouri; his address is District Health Department, Ozark, Mo.

JOHN B. H. BONNER, M.D.,† of Stony Creek, Va., Health Officer of Sussex County, has been appointed Director of a new health district in Prince George County, with headquarters in Hopewell.

* Fellow A.P.H.A.
* Member A.P.H.A.

ROBERT P. COOKE, M.D.,† of Lexington, Va., is Health Officer of Boteourt County, which has recently joined the Alleghany-Rockbridge Health Department thus forming a 3-county district. The office of the Assistant Health Officer, JAMES H. GORDON, M.D., is located at Covington, Va.

WILLIAM W. FULLER, M.D.,† of Christiansburg, Va., has been appointed Health Officer of Montgomery County.

ARTHUR H. GRAHAM, D.P.H., M.D.,† has been appointed Medical Director of the new district health unit established for the counties of Bullock, Chambers, Lee, Macon, Randolph, Russell, and Tallapoosa, Ala. Headquarters will be in Opelika, Ala. This is a coöperative enterprise between the Alabama State Department of Health and the Commonwealth Fund of New York.

J. B. IVY, M.D., is the new Director of the district health unit for Bradley, Lincoln and Cleveland Counties, with headquarters in Warren, Ark.

DR. EDWARD V. JONES, JR., has been appointed Assistant Health Officer of the Arlington County, Va., Health Department.

RUSSELL H. LYNCH, M.D., of Hollis, has been appointed Health Officer of Harmon County, Okla.

DR. H. B. MAGILL, JR., formerly Health Officer of the Hanover County Health Department, has resigned to enter private practice in Tappahannock, Va.

DR. RUFUS F. PAYNE† has been appointed Assistant Director of County Health Work in the Georgia State Department of Health. Dr. Payne was formerly Commissioner of Tift

County, where he has been succeeded by DR. ROBERT H. HARALSON, JR.† DR. JAMES M. SUTER, of Washington, D. C., has been appointed Health Officer of Lee County, Va.

Western States

DR. ROBERT E. AUSTIN has been appointed Health Officer of Coronado, Calif., to succeed DR. RAYMOND SPEAR.

DR. JAMES W. CREVER, JR., of Susanville, Calif., has been appointed Health Officer of Lassen County, Calif., to succeed DR. CLARENCE I. BURNETT.

DR. WILLIAM R. HICKS is the new Health Officer of the Multnomah County, Ore., health unit.

WENDELL A. JONES, M.D.,† of Riverside, Calif., has been appointed to take charge of the administration of the public health affairs of the city of Banning, under the Riverside County Health Department.

Canada

DR. NORMAN MACL. HARRIS* retired on superannuation, April 1, from the position of Chief of the Laboratory of Hygiene, Department of Pensions and National Health, Ottawa, Canada.

Foreign

DR. WU LIEN-TEH has retired after 30 years' continuous service, from 1907 to 1937. He was Vice-Director of the Army Medical College (China) from 1908 until 1910, when the Manchu Government sent him to take charge of the Manchurian Plague Prevention Service. In 1930 the Government decided to organize a modern Quarantine Service and Dr. Wu was made Director. He served as head of the Plague Prevention Service for 20 years and of the Quarantine Service for 7½ years.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

- American Academy of Tuberculosis Physicians. San Francisco, Calif. June 13-14.
- American Association for Social Security. New York, N. Y. April 8-9.
- American Association of Industrial Physicians and Surgeons—23rd Annual Meeting; and Second Annual Midwest Conference on Occupational Diseases. Palmer House, Chicago, Ill. June 6-9.
- American Association of Medical Social Workers. Seattle, Wash. June 26-July 2.
- American Association of Pathologists and Bacteriologists. Atlantic City, N. J. May 3-4.
- American Association of Psychiatric Social Workers. Seattle, Wash. June 26-July 2.
- American Association of Social Workers—Joint Meeting with American Association of Schools of Social Work, and National Conference of Social Workers. Seattle, Wash. June 26-July 2.
- American Association of the History of Medicine. Atlantic City, N. J. May 2.
- American Association on Mental Deficiency—62nd Annual Meeting. Hotel Jefferson, Richmond, Va. April 20-23.
- American Chemical Society. Dallas, Tex. April 18-21.
- American Federation of State, County, and Municipal Employees. Atlanta, Ga. August 29.
- American Heart Association. Sir Francis Drake Hotel, San Francisco, Calif. June 10-11.
- American Dental Association. St. Louis, Mo. October.
- American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9-14.
- American Home Economics Association—31st Annual Meeting. William Penn Hotel, Pittsburgh, Pa. June 28-July 1.
- American Medical Association. San Francisco, Calif., June 13-17.
- American Nurses Association. Hotel President, Kansas City, Mo. April 24-29.
- American Public Health Association—67th Annual Meeting. Hotels Muehlebach, President, Kansas Citian, Kansas City, Mo. October 25-28.
- American Public Welfare Association—Joint Meeting with National Conference of Social Workers. Seattle, Wash. June 26-July 2.
- American Society of Planning Officials. Joint Conference with American Planning and Civic Association, and American City Planning Institute. Minneapolis, Minn. June.
- American Veterinary Medical Association. New York, N. Y. July 5-9.
- American Water Works Association—Annual Meeting. Hotel Roosevelt, New Orleans, La. April 24-28.
- American Water Works Association. Montana Section. Baxter Hotel, Bozeman, Mont. May 13-14.
- Pacific-Northwest Section. Davenport Hotel, Spokane, Wash. May 19-21.
- Florida Section. Daytona Beach, Fla. May 23-25.
- New Jersey Section. Hackensack Water Company Plant, New Milford, N. J. May 25.
- Arizona Public Health Association. Tucson, Ariz. April 19-20.
- Association of American Physicians. Atlantic City, N. J. May 3-5.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13-15.
- Better Parenthood Week. Sponsored by The Parents' Magazine in co-operation with the U. S. Children's Bureau. May 1-7.

- California Association of Health, Physical Education and Recreation. Pasadena, Calif. April 18-19.
- California Conference of Social Work. Pasadena, Calif. April 24-28.
- Child Health Day, National. May 1.
- Conference of State and Provincial Health Authorities of North America. Washington, D. C. April 9-11.
- Congress of American Physicians and Surgeons. Atlantic City, N. J. May 2-6.
- Congress of Parent-Teachers Association. Battle Creek, Mich. April 20-22.
- Connecticut Public Health Association. Hartford, Conn. May.
- Georgia Public Health Association. Atlanta, Ga. May.
- Governmental Research Association. Princeton, N. J. September 7-10.
- Hawaii Territorial Medical Association. Honolulu, T. H. May.
- Health and Accident Underwriters Conference. Chicago, Ill. May 24-26.
- Health Officers and Public Health Nurses—Annual Conference. Under the Auspices of the New York State Department of Health. Saratoga Springs, N. Y. June 22-24.
- Hermann Michael Biggs Lecture—Annual. Subject, "Virus Diseases," Speaker, Thomas M. Rivers, M.D. New York Academy of Medicine, New York, N. Y. April 8.
- International Association for Dental Research. Minneapolis, Minn. May 12-13.
- International Association for Identification. Columbus, Ohio. August 16-20.
- International Association of Medical Museums, American and Canadian Section—with American College of Physicians and Surgeons. Atlantic City, N. J. May 2.
- Iowa Public Health Association. Des Moines, Ia. May.
- Manufacturing Chemists Association of the United States. Sky Top, Pa. June 2-3.
- Medical Library Association. Hotel Somerset, Boston, Mass. June 28-30.
- Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13-15.
- Michigan Public Health Association. Lansing, Mich. November 9-11.
- Mississippi Valley Conference on Tuberculosis. St. Louis, Mo. October 1-3.
- Missouri Public Health Association. Jefferson City, Mo. May 13-14.
- Mothers' Day. May 8.
- National Biennial Nursing Convention. Hotel President, Kansas City, Mo. April 24-29.
- National Conference of Social Workers—Joint Meeting with American Association of Schools of Social Work, and American Association of Schools of Social Work. Seattle, Wash. June 26-July 2.
- National Education Association. New York, N. Y. June 26-30.
- National Hospital Association (Negro).. Hampton, Va. August 14-16.
- National League of Nursing Education. Hotel President, Kansas City, Mo. April 24-29.
- National Negro Health Week (24th annual observance). Theme: The Family Doctor's Opportunity in Community Health Service. April 3-10.
- National Organization for Public Health Nursing. Hotel President, Kansas City, Mo. April 24-29.
- National Tuberculosis Association. Biltmore Hotel, Los Angeles, Calif. June 20-23.
- New Mexico Public Health Association. Albuquerque, N. M. June.
- New York State Association of Public Health Laboratories—22nd Annual Meeting. Mary Imogene Bassett Hospital, Cooperstown, N. Y. May 23.

New York State Department of Health—Annual Conference. Saratoga Springs, N. Y. June 28–30.

New York State Sewage Works Association—Fall Meeting (joint meeting with New England Sewage Works Association). Hotel Bond, Hartford, Conn. October 6–8.

New York State Sewage Works Association—Spring Meeting. Buffalo, N. Y. June 3–4.

Ohio Federation of Public Health Officials. Columbus, Ohio. April 29.

Pennsylvania Public Health Association. Harrisburg, Pa. May.

Smoke Prevention Association. Nashville, Tenn. May 17–20.

Social Work Publicity Council. Seattle, Wash. June 26–July 2.

South Carolina Public Health Association. Myrtle Beach, S. C. May 23–25.

State and Provincial Health Authorities of North America—Annual Meeting. Washington, D. C. April 9–11.

State and Territorial Health Officers Conference with the Surgeon General. Washington, D. C. April 11–12.

Texas Public Health Association. San Antonio, Tex. November 7–9.

Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2–9, 1939.

Western Branch, American Public Health Association. Hotel Multnomah, Portland, Ore. June 6–8.

FOREIGN

Industrial Accident Prevention Associations, Inc. Windsor, Ont., Canada. April 28–29.

International Association of Public Employment Services. Ottawa, Ont., Canada. May 26–28.

Ontario Health Officers' Association. Chateau Laurier, Ottawa, Ont., Canada. June 17–19.

Canadian Public Health Association. Lord Nelson Hotel, Halifax, N. S., Canada. June 20–22.

Royal Sanitary Institute. Portsmouth, England. July 11–16.

Scientific Congress of Doctors and Dentists—"ARPA." Prague, Czechoslovakia. July 21–25.

International Medical Society for Psychotherapy—10th Annual Congress. Balliol College, Oxford, England. July 29–August 2.

British Dental Association. Belfast, Ireland. July 29–August 3.

International Meeting for Cell Research. Anatomical Institute, Zurich, Switzerland. August 7–13.

International Congress on Housing and Town Planning. Mexico City, Mexico. August 13–20.

Sixteenth International Physiological Congress. Zurich, Switzerland. August 14–18.

British Association for the Advancement of Science. Cambridge, England. August 17–24.

PUBLIC HEALTH in the SOVIET UNION

a 5 weeks' survey under
leadership of

DR. HENRY E. SIGERIST
Director, Institute of History
of Medicine, Johns Hopkins
University; author, "Social-
ized Medicine in the Soviet
Union."

The Peoples Commissariat of Health is co-operating in a program which embraces the whole scheme of Soviet medical practice in the great cities, collective farm areas of the Ukraine, and health resorts of the Caucasus and Crimea. Requisite membership.

Sailing June 11. Back August 12.

For rates and other information
address:

THE OPEN ROAD

Dept. H

8 W. 40th St.

NEW YORK

Cooperating with Intourist

Best Sellers in the Book Service for March

Preventive Medicine and Hygiene (6th ed.)—Milton J. Rosenau, M.D.	\$10.00
Principles of Medical Statistics—A. Bradford Hill.....	2.25
The Traffic in Health—Charles Solomon.....	2.75
Rural Health Practice—Harry S. Mustard, M.D.	4.00
Manual of Public Health Bacteriology—Department of Health, San Francisco, Calif.	1.50
Socialized Medicine in the Soviet Union—Henry E. Sigerist..	3.50

Order from the Book Service

The American Public Health Association
50 West 50th Street New York, N. Y.

*The Twenty-Seventh Annual Meeting
of the
Canadian Public Health Association
will be held in
Halifax, Nova Scotia
on Monday, Tuesday and Wednesday
June 20, 21 and 22, 1938*

Headquarters: The Lord Nelson Hotel

American Journal of Public Health

and THE NATION'S HEALTH

Volume 28

May, 1938

Number 5

Qualifications of a Venereal Disease Control Officer*

THOMAS B. TURNER, M.D.

Staff Member, International Health Division of The Rockefeller Foundation, and Lecturer in Medicine and Lecturer in Public Health Administration, The Johns Hopkins University, Baltimore, Md.

FOR a number of years in some states and in most large cities public funds have been used to support the treatment of indigent syphilitics. Of late, however, this stop-gap medicine has given way to an ambitious program in which the objective is the control of syphilis. That this program offers hopes of success is attested by the experiences in certain European countries and in a few communities in this country, but it is already clear that the development of the program will, for the next few years at least, call for the expenditure of large sums of money. An important element in the success of the program undoubtedly will be the caliber of the physicians under whose direction it is developed. It is not only essential that the best available men be chosen to assume immediate direction of the program but it will be good economy in the long run if these men are given the opportunity

to secure training which will help them to meet the problems peculiar to the prevention and cure of syphilis. I have been asked to state what, in my opinion, should be the qualifications of a venereal disease control officer and to outline briefly the training which will best fit a person to assume a responsible position in a control program undertaken by states or large cities. Since the principles upon which control measures should be based have not been clearly defined for any of the genito-infectious diseases except syphilis, the discussion will be limited largely to the program as it relates to that disease.

The objectives of any syphilis control program, I take it, are twofold: first, to bring about a reduction in the annual attack rate of syphilis, and second, to bring about a reduction in the disability rate and the death rate among persons already infected. The principal measures by which it is hoped to attain these objectives are treatment of the person who is a potential source of infection in order to

* Read before the Health Officers Section of the American Public Health Association at the Sixty-fourth Annual Meeting in New York, N. Y., October 5, 1937.

render him non-infectious, and treatment of other syphilitics, perhaps of all syphilitics, in the hope of preventing or arresting the development of disabling or killing lesions of the disease. The application of these measures, however, is by no means simple, and the venereal disease control officer should be qualified to meet the main problems inherent in the program. One important problem is concerned with the best methods of discovering infected persons, particularly those who are in an infectious stage, and of bringing them under treatment. Another problem is how best to provide scientifically sound anti-syphilitic treatment for all who need it, under conditions which are socially decent and economically practicable. Finally an effort must be made reliably to measure the extent of the public health problem in its broader aspects and the results accomplished by the control program. It is evident that such a program must rely for its execution both upon the practice of so-called curative medicine and the use of methods commonly associated with the field of public health.

Although the syphilis control program is still in the developmental stage in this country, it is probable that in cities and thickly populated rural communities control efforts will be organized on a district basis and that the center of this administrative unit will be the well organized and well equipped syphilis clinic. This center, which may best be built around a hospital clinic, will provide treatment for the bulk of the cases in the district, and will serve as a diagnostic and consulting center for the area. Many other elements enter into a complete program, however. A majority of the cases of syphilis will probably be discovered by private practitioners and in various out-patient clinics of hospitals. Moreover, a fair number of cases will be treated in the offices of practitioners and specialists.

Efficient laboratory service must be available to each of these groups and the work of public health nurses and social workers must be correlated with the general program. Since the district will probably not be a natural epidemiologic unit, it will be necessary to maintain close coöperation between it and other districts. Clearly, therefore, the program must be given cohesion by an administrative officer who is a member of the city or state health department. Intelligently to administer such a program, the control officer must have a good working knowledge of clinical syphilology; he must comprehend the community aspects of the problem, and he should be qualified to collect and analyze data which have a bearing upon control measures and administrative practices.

SYPHILIS IN THE INDIVIDUAL

Except in rather small communities, the venereal disease control officer will not have the responsibility of operating clinics, nor will he be responsible for the immediate care of patients. Nevertheless, the general program is based so largely upon the treatment accorded the individual patient that often it will be necessary for the director of the community program to make decisions which will ultimately affect the clinical management of patients. After all, most of the control measures now in use have been formulated by applying a knowledge of the clinical course of the disease and of the effects of anti-syphilitic treatment to the epidemiologic problems involved. It is important that the person responsible for the application of these measures and for the evaluation of new methods should have a real understanding of the underlying principles upon which these measures are based. In other words, the venereal disease control officer should be in his own right a competent syphilologist.

Competence in the practices of syphilology depends first upon a knowledge of the clinical course of the disease and how to treat it, and second upon the ability to carry out certain technical procedures. All of us, of course, are familiar in a general way with the clinical course of syphilis—the progression through successive stages to clinical latency or to damaging lesions and ultimate death of the individual. But syphilis is a complex disease and within this general pattern there are innumerable variations in its clinical course, and these variations must be interpreted in terms of syphilis control. Likewise, the treatment of syphilis is not simple. A number of drugs are used in a variety of ways. The scheme of treatment differs with the stage of the disease and with the individual patient. Moreover, the toxicity of the drugs themselves raises numerous problems for the syphilologist. The venereal disease control officer should certainly be thoroughly familiar with the uses, limitations, and toxic effects of the drugs which are being used by him or under his direction.

The diagnosis and treatment of syphilis also entail the use of a number of technical procedures which require a fair degree of skill for their proper execution. No clinic can serve its purpose effectively in which intravenous and intramuscular treatment is not skillfully given. Minimum standards require that darkfield examinations for the presence of *Treponema pallidum*, spinal punctures, and physical examination for the presence of cardiovascular or central nervous system involvement be competently performed. The venereal disease control officer will be the better for having mastery of these techniques.

Serologic tests are today the keystone of the diagnosis of syphilis. While these tests are commonly made in central laboratories, it is exceedingly

important that the clinician and the administrator comprehend the fundamental nature of the tests and the safeguards that must be used in their application to clinical syphilology. The recent report of the Committee on Evaluation of Serodiagnostic Tests for Syphilis¹ showed that in 5 state laboratories tests were being used that gave positive results in less than half the specimens obtained from 200 known syphilitics, in 7 other state laboratories positive results were obtained in from 50 to 60 per cent, and in 7 others in from 60 to 70 per cent of specimens. Of graver import is the finding that in 3 state laboratories false positive tests were obtained in 10.1 per cent, 9.1 per cent, and 8 per cent, respectively, of the specimens examined from 100 presumably non-syphilitic individuals. Clearly, methods must be devised for making periodic checks on the sensitivity and specificity of serodiagnostic tests being performed in state, municipal, and private laboratories. Laboratory directors will doubtless welcome the opportunity to make such checks but it would seem to be the responsibility of the venereal disease control officer to initiate and coördinate this type of activity. In order to do this competently he should be thoroughly familiar with the various tests in common use and should understand the technical difficulties which confront the serologist.

SYPHILIS IN THE COMMUNITY

The community aspects of syphilis control may be divided into two broad phases. In the one, which Frost appropriately terms the "proximate" epidemiology of the disease, the problem is largely one of the identification of immediate sources of infection and exposed persons, and of bringing them under treatment. Coupled with this is the question of general case finding, for undoubtedly when a wide effort is

made to uncover cases of syphilis, such as by routine serologic testing by private physicians and in the outpatient departments of general and special hospitals, many actual or potential sources of infection are discovered which would otherwise go unrecognized. This "proximate" epidemiology is largely the immediate responsibility of clinic directors and practising physicians, but it is an important aspect of the general program and for this reason the program director should be thoroughly familiar with the problems involved and the best methods of meeting them. Further than this, however, there are many ways in which the venereal disease control officer can assist and coördinate the efforts of the treating agencies and indeed there is urgent need for active experimentation in this field.

The other broad phase of the epidemiology of syphilis is concerned with problems such as the accurate appraisal of the prevalence and distribution of syphilis in the community, its long-time effects upon individuals, and the relative importance of different factors in its prevalence. It is evident that these represent some of the most difficult and complicated problems in epidemiology, but the control officer is in a favorable position to make contributions to the study of such problems.

Although much has been added during the past 25 years to our knowledge of the manner in which syphilis affects the individual, little precise information is available upon the effect of syphilis on the community. Data on the prevalence or the attack rate of syphilis are relatively meager and consequently it is exceedingly difficult to secure reliable evidence regarding the effect of control measures on these rates. Since control measures will entail the expenditure of large sums of money, it is only reasonable to ask that

the events with regard to syphilis which follow this expenditure be measured in some tangible fashion. No one seriously questions the fact that there has been a substantial reduction in the morbidity and mortality rates from smallpox, typhoid fever, diphtheria, and tuberculosis during the period over which control measures have been directed toward these diseases. The responsibility for obtaining comparable figures for syphilis would seem to rest primarily upon the venereal disease control officer.

In collecting data of this nature it is of fundamental importance that the original clinical observations be correctly made. Except in a few of the better syphilis clinics even basic elementary data, as for example, whether the patient had early or late syphilis cannot today be relied upon. As director of the program, the venereal disease control officer should know what information it is necessary or desirable to obtain, he should make every effort to see that his coöperating clinicians are in a position to obtain this information, and he should be able correctly to analyze and intelligently to interpret the data that are secured. Finally, he should be able to appraise critically the value of existing or proposed measures directed toward syphilis control.

For the venereal disease control officer to deal effectively with these problems he should have a good grasp of clinical syphilology, he should have a working knowledge of bio-statistics, and he should know in what manner epidemiologic data have in the past contributed to the control of other diseases. Finally, this officer should be acquainted with current practice in public health administration.

INVESTIGATION OF PROBLEMS RELATING TO SYPHILIS CONTROL

Although the lines along which syphilis control should proceed seem to

be fairly clear, it is scarcely necessary to point out that new knowledge of the disease may contribute greatly to more effective control. It is important that new facts be sought for in the laboratory, in the clinic, and in the field. Except in rare instances, a venereal disease control officer may have no opportunity to carry out laboratory investigations. Likewise the study of syphilis in the individual patient should probably be attempted only in well organized clinics. The control officer, is, however, in a peculiarly favorable position to make substantial contributions to our knowledge of syphilis in the community. It is not to be expected, of course, that every public health physician interested in syphilis will be able to add to the existing knowledge of the disease. It is highly desirable, however, that every venereal disease control officer should comprehend the main questions upon which it is believed field studies will throw additional light, and as a minimum contribution attempt to collect basic data on these questions in such form that they can later be used either by himself or others. In the selection of venereal disease control officers, then, consideration should be given to those who seem to possess the potentialities for doing investigative work, and in the training of candidates for responsible positions in the syphilis control movement every effort should be made to develop a critical attitude of mind.

THE TRAINING OF A VENEREAL DISEASE CONTROL OFFICER

Training in the clinical and field aspects of syphilis and other genito-infectious diseases can be obtained, of course, without formal instruction by actual work in clinics and in public health departments. The same amount of training, however, can be secured in a shorter period of time and with less effort through the medium of organized

university courses. Such courses should extend over a period of not less than 6 months, preferably 1 year, and in general the work should be largely practical with a minimum of didactic instruction.

Proficiency in the diagnosis and treatment of syphilis can be acquired only by work in a well organized syphilis clinic under competent supervision. Diagnosis in syphilis depends to a much greater extent than formerly upon the skilled use and correct interpretation of a few laboratory procedures, and to a much less extent upon detailed clinical differential diagnosis. Successful treatment depends largely upon striking a happy balance between routinization and individualization in the use of various treatment schemes. These things can be learned by the physician only if he has the responsibility of diagnosis and treatment of individual cases. Under these conditions the average physician, even though long out of the practice of medicine, can within a year acquire competence in syphilology far above that of the average practitioner. During this period he becomes familiar with physical diagnosis as applied to syphilis, with the use of the darkfield microscope for diagnosis, with the technic of doing spinal punctures, and with the preparation and administration of anti-syphilitic drugs. Along with clinical work a period of time should be spent in the serologic laboratory, where opportunity is afforded for actually performing the various tests used in diagnosis.

These accomplishments in an administrative officer may to some seem quite useless, but with them he will not only have a much clearer comprehension of his problems but he can also with assured authority give useful instruction to his cooperating clinicians. During the past year I have had the responsibility of supervising instruction offered to physicians whose immediate

interest is in syphilis control. Some of these men have been filling administrative positions while others have been directors of venereal disease clinics. I think it is correct to say that in the opinion of these men the opportunity to work in a well equipped university clinic where emphasis is put upon the careful study of a relatively few patients has been most beneficial.

Just as training in the clinical aspects of syphilis can best be obtained in a teaching clinic, so can training in the epidemiologic and administrative aspects of syphilis be acquired more readily through the medium of a health district which has been organized for teaching purposes. In such a district, problems relating to the prevalence and distribution of the disease, the sources of infection, the most efficient methods of discovering cases of syphilis, and the best methods of providing for their treatment may be studied. As yet only a few broad principles can be taught with any degree of assurance, for on many points there are insufficient basic data on which to establish administrative procedures. The student will profit most by taking an active part in the administrative, epidemiologic, and investigative work in progress in the district. He should become familiar with the type of records in current use and with the relationship of the administrative officer to clinics and private practitioners in the district. He should at some period in his training assume responsibility for contact investigation and follow-up work in the district. He should also become familiar with the functions of the public health nurse and medical social worker in the syphilis control program.

A major portion of the time of the student will then be spent in the clinic and in the health district, but his training should be supplemented by work in related subjects. It is highly desirable that the prospective venereal

disease control officer should be well grounded in the elements of biostatistics and such a course should be available to the student. Likewise, much may be gained by a study of the epidemiology of other chronic infectious diseases, notably tuberculosis. For those who lack a long training in practical public health administration, formal courses in this subject will go far toward elucidating the problems most commonly met and the public health practices which have stood the test of actual experience.

The entire course of training should be given a sense of unity through frequent seminars. These seminars may be used for the group discussion of the field and clinic work and for the more formal discussion of some of the major problems concerned in syphilis control. The literature of syphilis is full of assertions and arguments based on quite inadequate evidence, and it is important that these be examined in critical fashion.

Finally, I feel that every student doing special work in syphilis should have the opportunity to study intensively some particular problem, however small, in this field. The capacity for doing investigative work will vary, of course, with different students and the problems studied must vary accordingly. I am firmly of the opinion, however, that the investigation of some problem is a most valuable educational medium. Almost any problem, whether related to the clinical, epidemiologic, or laboratory aspects of syphilis, has ramifications which will take the curious and industrious student far beyond the bounds of the immediate subject. This type of study is practicable only when the student is in residence for 6 months or longer, and it can only be done under the supervision of instructors capable of guiding the student in the selection and in the study of a worthwhile problem. Many of these studies

may not contribute directly or even materially to syphilis control, but if the study is carefully planned and intelligently developed it will go far toward developing a critical attitude of mind in the student. Moreover, there is always the chance that an occasional student will be stimulated to the point of continuing sound investigative work along with his routine duties in actual syphilis control.

The foregoing discussion has been concerned largely with the duties of the director of the general community program and the qualifications which would seem to be desirable in such a person. Second in importance only to this officer are the directors of the clinics which form the keystone of the control program. The duties and responsibilities of these men have been only alluded to and cannot be discussed fully at this time. It is evident, however, that somewhat the same qualifications recommended for the venereal disease control officer would be equally desirable in a clinic chief. The latter should perhaps be a somewhat more accomplished syphilologist, but it is also important that he fully comprehend the community aspects of the program. Training in clinical syphilology, in the epidemiology of the disease, and in certain related disciplines such as bio-statistics, would prove equally valuable to the clinic director.

SUMMARY

Measures directed toward the control of syphilis entail both the practice of

so-called curative medicine and the use of methods commonly associated with the field of public health. In order soundly to administer such a program the venereal disease control officer should be thoroughly familiar with each of these aspects of the problem. He should have a good working knowledge of clinical syphilology, on the one hand, and bio-statistics, epidemiology, and public health administration as these disciplines apply to syphilis, on the other. Moreover, he should be capable of collecting and analyzing data bearing on syphilis which will aid in rendering control measures more effective.

Training to meet these qualifications can readily be obtained in teaching centers where facilities are available for clinical work in the diagnosis and treatment of syphilis, for study of the epidemiology of the disease, and for the observation of control measures in actual operation. The work should be largely practical, supplemented by a few formal courses and seminars. An important feature of any course of training lasting 6 months or longer should be the opportunity for each student individually to carry out an investigation of some problem related to syphilis and its control, and every effort should be made to develop a critical attitude of mind in the student.

REFERENCE

1. Parran, T., Hazen, H. H., Mahoney, J. T., Sanford, A. H., Seneac, F. E., Simpson, W. M., and Vonderlehr, R. A. A Comparative Study of Serodiagnostic Tests for Syphilis as Performed by Thirty-nine State Laboratories. *Venereal Dis. Int.*, 15:275 (Aug.), 1917.

Preparing the Nurse to Meet Community Needs in Public Health*

MARION G. HOWELL, R.N., M.Sc.

*Professor of Public Health Nursing, Western Reserve University,
Cleveland, Ohio*

IT IS rather significant that the discussion of such a group as this should this year direct its consideration to public health nursing education in relation to meeting community needs. At other times we have talked of the preparation of the public health nurse but only recently have we seemed to stress whole community needs. We trust such a title is prophetic and that the time will come when the public will demand and make possible needed public health facilities.

It may be well for us to ask first what we consider community needs in public health. Certainly our ideas of community needs have developed in the last quarter of a century and in direct relation to accepted standards of living, discoveries and new practices in the science of medicine, new methods of transportation, as well as facilities for wider dissemination of knowledge. Education, research, legislation and transportation have figured heavily in the changes in our modern conception of community health. Whereas, epidemics of smallpox, typhoid fever, and diphtheria, were once tolerated as the gifts of the gods, we now have as our objec-

tives not only the control and prevention of communicable diseases but the promotion of health—mental and physical—the organization of communities for community planning, and action in health and social welfare.

In these changing programs the public health nurse assists as a staff member, as a supervisor, or as a director of nursing service in official or nonofficial agencies, and her duties are manifold. In the *A.P.H.A. Year Book, 1936-1937*,¹ we have a report of the Sub-Committee on Educational Qualifications of Public Health Nursing of the Committee on Professional Education, approved by the National Organization for Public Health Nursing and by the Governing Council of the American Public Health Association, which sets forth the minimum qualifications for those appointed to positions in public health nursing in the years 1935-1940. This report emphasizes the changes that are taking place in the basic education of the nurse in the undergraduate school of nursing where there is increased emphasis on the social and health aspects of nursing as an inherent part of the preparation of all nurses. There has since been published a *Curriculum Guide for Schools of Nursing*, which is the result of widespread study and consultation under the leadership of the Committee

* Read at a Special Session of the Committee on Professional Education of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

on Curriculum of the National League of Nursing Education. The title of this new publication and the methods used in its preparation indicate to some extent the professional growth of the last decade.

It has been said that no other profession has made as extensive a study of its curriculum, or has succeeded in organizing so many study and consultation groups throughout the country, with the result that there is now unusual opportunity for better preparation of all nurses and for more careful selection of students accepted by the schools of nursing.

The survey of public health nursing conducted by the National Organization for Public Health Nursing showed the great need for better qualified personnel and stressed the need of better preparation for health teaching. Since schools of nursing control the intake of the nursing profession, and, therefore, the quality of public health nurses, it is highly important for the public health personnel to see the problem as a whole and make wise and concerted effort to bring into the nursing profession that type of young woman who is successful in the public health field—the intelligent young woman from a home of culture where honesty, industry, and integrity are considered important and where tolerance, patience, and faithfulness to duty are practised. Fortunately, more of these young women are today completing high school and college, and are entering nursing when they are more mature and have better preparation for the exacting requirements of the profession. Fortunately also the nurse entering the better school of nursing today has a greater opportunity for learning and for developing nursing skills and for learning more of public health and social aspects of nursing. Some of them study under the direction of qualified public health nurses and some are

fortunate enough to have an affiliation with a public health nursing agency. We may venture to say that today almost all student nurses have better opportunities for preparation in nutrition, in pediatrics, and in obstetrics than ever before, and even so there is much room for improvement.

In considering the community needs in public health today, it may be claimed that in our older programs we have gone about as far as we can until we change our emphasis—for example, the infant welfare program. In some cities the infant morbidity and mortality rates have steadily decreased, and perhaps cannot be further changed to any extent until we attack the problem of early infancy. In the same cities some claim we cannot do much more in the schools until the problems of administration are solved. In the meantime, should we review our generalized programs in an effort to determine which phases need increased emphasis? Should we do more to meet the needs of the community in regard to prenatal and maternity work, including maternal health programs? Should we place more emphasis on the preschool program and the work with cripples? Should we do more in the fields of industry, in nutrition, in mental health, in the prevention of all communicable diseases? Should we do more in community organization? Should we know more about how to study communities, and should we keep better records of our work? If so, we have much to do by way of preparation of both the health officer and the public health nurse.

It is practically impossible, in the basic course in nursing, to give more than the fundamentals of some of these programs since the student's practice is largely confined to the hospital wards, and she has all too little time to learn what there is to learn. It is, therefore, necessary for her to have opportunity

to learn in the public health fields. As you know, we have had so-called postgraduate courses in public health nursing in the United States for the last 30 years and we have today 17 courses accredited by the National Organization for Public Health Nursing. In order to complete one of these courses, the graduate nurse has to give up a year's salary and spend almost its equivalent in meeting the expenses of this postgraduate program. She must also meet university entrance requirements and have recommendations indicating her aptitude for public health nursing. Since such a program is fairly expensive for the average nurse, and since there have been comparatively few scholarships, too small a number of nurses have been able to avail themselves of these opportunities. However, with the provisions of the Social Security Act, a limited amount of public money is now available for public health nursing education, and various plans for its use have evolved.

In a recent statement in *Public Health Nursing*,² the Educational Supervisor of Nursing, New York State Department of Health, has told of their plan which I commend. Miss Blaisdell states that they are approaching the problem in 2 ways:

One is aimed at strengthening the present staff, and the other seeks to add well prepared public health nurses. As a part of the first activity each public health nurse supervisor and administrator in the state is constantly looking for the staff workers who seem especially promising for development, and all public health nurses in the state have been given an opportunity to make known their professional aims and ambitions in a confidential questionnaire sent out by the Division of Public Health Nursing. From these two sources the selection of nurses for postgraduate work is being made.

We are encouraged by noting that

... nurses in state, county, city, school and *nonofficial organizations* are represented among the group who are having this privilege

and stipends are usually given for one semester of college work. In most instances these nurses are required to give at least one year of service to the state in any place requested.

This seems to be a very practical and successful plan in which I would like to make only one change, namely, that those given the stipends be allowed to complete at least a year's study, meeting the added expense from private funds even if they must be borrowed. This plan has these advantages:

1. A year gives the student more time to adjust to a university program.

2. She has opportunity to enroll in courses which run throughout the academic year.

3. The nurse taking her place in the field has more time to adjust to a new field program (this is especially important in a rural area where a new nurse is only fairly well started at the end of 16 or 18 weeks).

4. By making a personal financial investment the student will feel more independent and free from possible political entanglements.

5. Such a plan will safeguard the problem of granting stipends where the nurse is not especially interested in public health nursing.

6. It helps to insure good work on the part of the student.

7. It allows time for the completion of the requirements for a certificate in public health nursing.

Miss Blaisdell has also explained the New York plan of giving experience to beginners in public health nursing by an exchange system with several of the well supervised *private* organizations in the state.

This plan provides that in exchange for each stipend given to one of its selected staff nurses, the private organization takes 2 carefully selected beginners for 4 months of introduction to field work. Each beginner is given half the salary of the staff nurse who

was granted the stipend. The main stipulation is that the organization have a director of the student program who meets the same requirements as the faculty of an approved course in public health nursing.

It seems to me an important provision of this plan is a committee on selection of beginning students, made up of members of the 3 state nursing organizations, together with a representative of the State Department of Health, and one from the Civil Service Commission. In addition to these provisions, there is a state-wide staff education program for all public health nurses in the state.

Other states are experimenting with similar plans, and private and public organizations are encouraging their staff members by granting time for study, and by special staff education programs.

The courses in public health nursing are attempting to strengthen their programs in both theory and practice and, while not minimizing the fundamentals, are adding courses to enable the nurse to know more of her rôle in the control of syphilis, in the care of cripples, in the care of the mentally ill, in health education, and in nutrition. Much needed courses in supervision and administration are developing.

In meeting community health needs the nurse is an assistant, a member of a so-called health unit staff, who is entrusted with the privilege of entering the home, the school, the factory. To many in the community she is the best known representative of the health department or the private agency. Her preparation and service, therefore, reflect the standards of the whole program. The health officer and the taxpayer alike take pride in her success and are baffled by her failures. They expect almost perfection in personal and professional qualifications, with enough knowledge of science to interpret public health to the lay group and enough

nursing knowledge and skill to care for the seriously ill.

Fortunately, this preparation for public health nursing is a continuous process and professional experience with study brings professional development. No one can estimate the value of the present popularity of health. Families and communities are today more health conscious, have a greater desire for health, have an increased appreciation of the value of health, and make more use of hospitals, nurses, and physicians.

As a rule most communities know little, and assume even less responsibility in the selection and preparation of the personnel of their health units. The medical and nursing professions have an opportunity today which is probably without equal in peace times, namely, to secure the intelligent interest and support of our communities to provide financial support, not only for health programs, but also for the preparation of the professional personnel who must administer these programs—to secure their help in encouraging their finest young women to enter the field of nursing, and to have their aid in financing good schools of nursing and public health nursing agencies of high standards. In public health nursing we may say that we are limited only by our own limitations. Concerted effort for community support of nursing education is fundamental. We cannot rise higher than our source.

The success of public health nursing is largely dependent on the type of young woman entering the profession and the opportunities she has for learning.

United and continuous effort for the support of good schools of nursing offering good basic preparation, and the wise selection of students entering these schools will in time give us much encouragement. Nursing education in many countries is focusing on public health nursing and if a committee such

description of these organisms is presented below.

The fundamental requirements for the production of paper having satisfactory sanitary quality are a pure process water; virgin pulp from sound, clean wood, produced and handled under hygienic conditions; and strict control of microorganisms throughout pulp and paper making operations. Certain mills are so situated as to be able to utilize pure mountain water, which is filtered and chlorinated as an additional safeguard. Some mills almost completely eliminate microorganisms, during the entire manufacturing process. The paper from these mills is practically free of microorganisms, slime spots, and objectionable odors, all of which, if present, suggest an inferior sanitary quality.

In many cases a naturally pure water supply is not available, and extra precautions must be taken to prevent contamination of mill systems by undesirable organisms and establishment of slime-forming types in pipe lines, chests, and tanks. Preventive measures are being satisfactorily practised by several mills.

Local conditions at some of these plants render the microbiological control problem particularly difficult. The majority of paper mills making food container board have succeeded in producing board which has low bacterial counts through an effective use of chlorine in bactericidal treatments for pulp and paper making operations.

Sanitary specifications for this grade of paper seem, therefore, to be reasonable and justifiable.

TYPES OF MICROORGANISMS FROM PULP AND PAPER MILLS WHICH PERSIST IN CONTAINER BOARD

A list of the species of microorganisms which predominate in pulp and paper mills has been previously given by the writer.¹ In recent investiga-

tions, samples of container board for milk were obtained under aseptic conditions from paper mill driers, calenders and reels, from which certain representative, constantly recurring species were isolated.

REPRESENTATIVE SPECIES OF MICROORGANISMS ISOLATED FROM CONTAINER BOARD

<i>Bacillus subtilis</i>	<i>Micrococcus ureae</i>
<i>Bacillus cereus</i>	<i>Micrococcus candidus</i>
<i>Bacillus megatherium</i>	
<i>Bacillus vulgatus</i>	<i>Aspergillus niger</i>
<i>Bacillus mycoides</i>	
<i>Bacillus petasites</i>	<i>Sarcina</i> sp.

These and related forms also occur in rinsings from fabricated, moisture-proof containers. Representative isolations include the following:

CONTAINER TYPE A	CONTAINER TYPE C
<i>Bacillus subtilis</i>	<i>Bacillus subtilis</i>
<i>Bacillus cereus</i>	<i>Bacillus cereus</i>
<i>Bacillus mycoides</i>	<i>Bacillus mycoides</i>
<i>Bacillus tumescens</i>	<i>Bacillus tumescens</i>
<i>Bacillus vulgatus</i>	<i>Bacillus albolactis</i>
<i>Bacillus peptogenes</i>	<i>Bacillus megatherium</i>
<i>Bacillus petasites</i>	<i>Bacillus peptogenes</i>
<i>Penicillium</i> sp.	<i>Micrococcus ureae</i>
<i>Oidium</i> sp.	<i>Micrococcus varians</i>
	<i>Sarcina</i> sp.
	<i>Actinomyces</i> sp.
	<i>Penicillium</i> sp.
CONTAINER TYPE B	CONTAINER TYPE D
<i>Bacillus subtilis</i>	<i>Bacillus subtilis</i>
<i>Bacillus cereus</i>	<i>Bacillus cereus</i>
<i>Bacillus mycoides</i>	<i>Bacillus mycoides</i>
<i>Bacillus tumescens</i>	<i>Bacillus megatherium</i>
<i>Bacillus petasites</i>	<i>Bacillus petasites</i>
<i>Micrococcus albus</i>	<i>Alternaria</i> sp.
<i>Micrococcus aurantiacus</i>	<i>Aspergillus</i> sp.
<i>Micrococcus flavus</i>	
Red chromogens (slimy)	
<i>Sarcina</i> sp.	
<i>Actinomyces</i> sp.	
<i>Fusarium</i> sp.	
<i>Spicaria</i> sp.	
<i>Aspergillus</i> sp.	
<i>Penicillium</i> sp.	

The microorganisms characteristic of these 4 widely different types of containers are representative as well of the 3 additional types of containers from which isolations were made.

The organisms found in these paper containers undoubtedly originated in the pulp and paper mills since nearly

all of the above species have also been isolated by the author from these sources.

BACTERIAL COUNTS OF CONTAINER BOARD

It has been found that drier temperatures cannot be relied upon to eliminate all of the heat resistant, non-spore-bearing and slime forming microorganisms present in pulp, nor the spore producing species naturally present in appreciable numbers. It is possible to isolate a fairly diversified flora from freshly made board. These organisms may not be present on the outer surfaces of the board, but their numbers can be determined in uniformly disintegrated stock. Various methods of disintegrating board aseptically are available, such as } by shredders, agitators, and grinders. Bacterial plate counts of disintegrated container board from mills that employ reasonable sanitary control are consistently less than 500 colonies per gram, and this count has been adopted tentatively as standard for this grade of paper.

Where unusually careful attention is

paid to sanitary conditions, results are normally under 100 colonies per gm., even approaching a bacteria-free state. Representative board counts from several mills are shown in Table I.

SANITARY STANDARDS FOR CONTAINER BOARD

The use by mills of paper stock which has previously been employed for commercial purposes (secondary stock) is not consistent with standards of food quality. This statement applies particularly to the use of old board, miscellaneous waste paper and rags. Sanitary control over the product of a mill should include the identification of the fibers used; calculation of dirt content based upon the numerical estimation of dirt in pulp according to methods suggested by the Pulp Testing Committee of the Technical Association of the Pulp and Paper Industry; presence of slime spots identified by microscopic examination; and determination of the bacterial count per gram of disintegrated board.

An application is being made of sani-

TABLE I
Number of Bacteria in Milk Container Board

Colonies per Gram of Pulp at Cylinders Before Formation of Sheet Showing Counts Obtained Under Various Control Methods. Mill B		Colonies per Gram of Disintegrated, Freshly Made Board			
Pat No		Mill A	Mill B	Mill C	Mill D
1	78,000	318	301	43	62
2	36,000	423	446	35	42
3	98,000	104	229	51	26
4	30,000	86	510	84	95
5	34,000	97	593	67	36
6	8,200*	141	352	61	49
7	9,200*	106	206	87	43
		170	246	55	54
1	3,600*	237	105	64	54
2	9,300*	118	318	58	11
3	19,500				
4	23,500				
5	33,750				
6	8,650*				
7	8,450*				
1	300				
2	150				
3	400				
4	150				
5	170				
6	41*				
7	42*				

* Indicates layers containing of 100 per cent bleached sulphite pulp; other layers contain ground wood

tary principles in the production, handling, fabrication, and use of container board and wrappers for various perishable foods besides milk, including other dairy products, shellfish, fatty foods, meats, bread, and breakfast foods.

HANDLING OF CLEAN WRAPPERS AND CONTAINER BOARD

Sanitarily produced food wrapper and container board should be properly protected against contamination from dirt and promiscuous handling. With the aid of protective wrapping for paper and mechanical handling of stock during conversion or fabrication processes, much of the contamination which formerly occurred following paper manufacture is being eliminated. In accordance with the spirit of the U. S. Public Health Service Standard Milk Ordinance, which specifies that after bactericidal treatment all bottles, cans, and other milk or milk products containers shall be protected from flies, dust, flushing water, and direct human contact contamination, container conversion and food plants are reminded that the board which they obtain from the best paper mills has already received, in effect, bactericidal treatment and should be adequately protected from all possible types of contamination.

EXAMINATION OF FABRICATED PAPER CONTAINERS FOR MILK

The present satisfactory paper milk container is sanitarily manufactured from virgin pulp and contains less than 500 bacteria per gm. of disintegrated board. In paper milk container manufacture, the chief sources of microbial contamination are the paper stock and manual contact. With the elimination of the latter through the development of mechanical handling, paper stock contamination continues to be a prominent source of organisms even after impregnation or coating with paraffin.

There is a certain amount of defective paraffining of containers and it is, therefore, not surprising that all types of finished paper milk containers show a few bacteria present. They are present on the inner surface of the container and may consistently contaminate successive sterile 10 c.c. rinses. Practically, however, a single 10 c.c. rinse, made and plated out in conformity with the latest Standard Methods recommended by the American Public Health Association, gives a fairly accurate and indicative count. The examination of containers in actual use by representative dairies provides the best index to the sanitary condition of these containers.

Board which is practically free from bacteria and handled aseptically, yields containers which either produce no growth of organisms, or plate counts between 1 and 15 per container made by plating all of the water from a 10 c.c. rinse on standard agar.

Average plate counts for all types of paper milk containers are usually less than 50 per container. The results shown in Table II are typical of these tests.

TABLE II
Bacterial Content of Fabricated Containers

Container	Number Examined	Per cent Showing No Growth	Approximate Average Count
A	253	44	29
B	172	7	34
C	78	14	9
D	75	12	22
E	156	0	50
F	200	54	4

It is interesting to find very low counts in Container F where much of the container board used is practically bacteria-free.

Considerable attention is also being directed toward the adhesives employed in the manufacture of containers as a possible source of contamination. Perhaps the most satisfactory kind of adhesive, from a hygienic standpoint,

is the synthetic thermoplastic or "hot melt" type of adhesive. However, while some of the gluing and sealing materials in common use are readily subject to attack by microorganisms, it is ordinarily possible to utilize them in forms or grades which do not contaminate containers with microorganisms. Odorous, highly perishable animal glues are obviously not suitable for use in the manufacture of food containers.

Chemical preservatives or germicidal agents are not necessary nor helpful as ingredients in the high quality materials prescribed for paper containers used for food. It is conceivable that certain substances may be employed in the manufacture of container materials which might be retained and exert bacteriostatic or germicidal effects. For this reason the use of such substances or agents should be prohibited unless they have been shown by means of

physical, chemical, or biological tests supported by clinical evidence, to be non-toxic and without effect on milk.

The goal of the present investigation of the sanitary condition of food containers is to produce, if possible, consistently sterile paper and to make sterile containers from this sterile stock. Perhaps this goal is unattainable. We believe, however, that through the coöperation of pulp and paper manufacturers, conversion plants and food industries, and the intelligent enforcement of proper regulations by public health authorities, significant improvements can be achieved in the near future in the sanitary condition of food paper containers used for perishable food products such as milk.

REFERENCES

1. Sanborn, J. R. Microbiological Control in the Manufacture of Paper Wraps and Containers for Foods. *Indust. Eng. Chem.*, 29:949 (Aug.), 1937.
Development and Control of Microorganisms in a Pulp and Paper Mill System. *J. Bact.*, 26, 373 (Oct.), 1933.

May, 1938

Disintegration of Paper Board for Bacteriological Examination*

J. R. SANBORN

New York Agricultural Experiment Station, Geneva, N. Y.

PUBLIC health officials are interested in a means by which they can determine the bacteriological condition of paper board for food containers. Total bacterial counts furnish one means of judging the probable sanitary state of the pulp and paper mills that produce such paper. The technic described below, developed primarily for use in control laboratories, is convenient, rapid, inexpensive, and applicable to the requirements of routine bacteriological analyses. In order that the usefulness of this technic may be determined and improvements suggested where desirable, this description of the technic that has been used in studies of paper milk containers at the New York Agricultural Experiment Station has been prepared.

For the determination of bacterial counts on samples of paper board used in contact with foods and drinks, such as water, milk, cheese, ice cream, and oysters, it is desirable to utilize a method of disintegration which reconverts the paper to a uniform pulp suspension suitable for distribution in ordinary Petri plates.

DISINTEGRATION APPARATUS

The apparatus consists of a simple mixing or churning device with double

propellers which exert a beating action on the fibers (Figure I). The equip-



APPARATUS FOR PAPER BOARD DISINTEGRATION

ment found most convenient and useful is a modification of an electrically operated food mixer (Powermaster Model 1669, obtainable from Sears, Roebuck and Company, Motor and stand about \$5.00, propellers about \$.25 each). A three-speed motor, used on alternating or direct current voltages, is mounted on a firm base which is used without the revolving disk base and other unnecessary equipment ordinarily supplied with this mixer. The motor case attaches to a hinge pin which allows it to be tilted when the

* Approved by the Director of the New York State Agricultural Experiment Station for publication as *Journal Paper No. 243*, Jan. 3, 1938.

propellers are removed from the can in which the paper is disintegrated.

Before use, the blades of the two propellers should be so adjusted that they mesh while whirling toward each other, producing the shearing or beating action necessary for pulling the fibers apart. Extra propellers obtainable with the motor as beverage stirrers may be adjusted and used in pairs, each member complementing the other in position and pitch.

Square metal jars made from monel metal or other rust proof metal sheets by any tinsmith are used to hold the board as it is disintegrated in sterile water. These are covered with a loosely fitting metal cover and are 7" in height by $4\frac{1}{2}$ " square, and hold more than 1 liter. When in use they may be readily set up with a heat sterilized, corrugated paper board cover arranged to fit snugly against the base of the motor. If an ordinary 2 qt. square glass churning jar is used, the arm of the stand may be raised above the base by the introduction of a wooden block between the supporting arm and the base.

PREPARATION OF SAMPLE

Container board samples will ordinarily be collected by health authorities as sheets or as collapsed containers measuring about 9" by 12". These may be collected from milk plants or converting factories by means of sterile forceps and packaged and sealed in sterile paper wrappers or envelopes. Blanks are removed from wrappers with sterile forceps and edges are trimmed with sterile scissors. The margin of the blanks may have a coating of adhesive which means that a strip at least $\frac{1}{2}$ " wide should be cut off and discarded. Holding the trimmed blank firmly with sterile forceps, strips of board are cut with sterile scissors and, from these, small pieces of paper are clipped into sterile

receptacles. Other sterile cutting devices may be employed. Sterile 150 mm. Petri dishes may be used to receive clippings. Ten gm. quantities of clipped board are weighed out from the main supply in sterile dishes or beakers, using sterile forceps.

DISINTEGRATION OF PAPER BOARD

Ten gm. quantities of paper board are introduced into the covered metal or glass churning jar with 500 or 1,000 ml. of sterile water. The precise amount of water used will depend upon the nature of the sample and the capacity of containers. The total volume of suspension should be accurately determined after disintegration. Metal jars with metal covers that can be sterilized by autoclaving are preferable to glass jars (See Figure I). If the latter are used it may be necessary, because of the danger of breakage, to sterilize with chlorine solution, after which there must be thorough rinsing of containers with sterile sodium thiosulphate solution followed by a rinse of sterile water.

If the paper board is tough, clippings should be soaked in sterile water at a temperature of less than 40° F. for 2 to 15 hours preferably in a refrigerator. After soaking, the jars containing the paper are immediately adjusted to the churning device with its sterile propellers and sterile corrugated board cover. If the blades are properly set, churning at high speed for 10 minutes should cause complete disintegration of even very tough paper board. Without soaking, tough board may take as long as 30 minutes to disintegrate.

PLATING TECHNIC

In the case of good quality board, 10 ml. amounts of disintegrated stock may be plated with standard agar in 150 mm. Petri dishes. Where board is heavily contaminated, smaller quantities of pulp or prepared dilutions may be plated using regular 100 mm. dishes.

Pulp suspensions should be drawn into the 10 ml. pipettes through the large end or the pipettes should have large openings at the tip. Incubation may be carried on at 32° C. for 48 or 72 hours, or at 37° C. for 48 hours. Counts of colonies are readily made especially where the plates are well illuminated by transmitted light. Colonies of spore-forming bacteria, micrococci, actinomyces, and other heat resisting species of microorganisms are

easily recognized, even in the presence of thin suspensions of pulp.

This technic has already been used in making numerous determinations of the number of microorganisms present in various types of paper and paper board. The results of these tests and their significance will be discussed in subsequent papers. The technic is described at this time in order that others may be stimulated to make similar studies.

Control of Nuisances*

EDWARD WRIGHT

Sanitary Engineer, State Department of Public Health, Boston, Mass.

THE control of nuisances in the up-to-date public health department is in a sense a less important subject than many of the public health problems relating to the control of disease transmitted from man to man. The difference in opinion between the medical man and the non-medical health agent in the fight against disease and in the improvement of the public health was over years ago, perhaps when Chapin pointed out so forcibly that a cesspool is dangerous to health principally when some one falls into it. In the 90's, much of the work of the Massachusetts Department of Public Health was of a sanitary engineering character. While that work has grown very considerably since 1900, the other divisions of state health work of a medical character have grown by leaps and bounds with the vast increase in medical efficiency. This does not mean there is nothing left to be done by the non-medical man in public health, for nuisances and environmental upsets will continue just as surely and regularly as taxes. This was so with our grandfathers and great grandfathers, and the work of the health department is still assumed by many to be largely in nuisance control.

The sense of smell is one that cannot be ignored. Organized cleanliness

is essential for a happy environment and, while the purpose of up-to-date public health work is to prolong life, it is not necessarily advancing it to a high plane unless the sanitarian has an important part in the picture. The American people will doubtless continue to insist that health and comfort be kept together and not be separated by law. The control of a nuisance and the object of sanitary work is not necessarily to prevent injury to health but more largely to promote health in much the same way that a safe water supply may be filtered or otherwise treated to reduce color rather than to remove germs of disease.

Rosenau¹ defines a nuisance as "the use of one's property in such a way as to injure the rights of others, and inflict damages." A nuisance is an annoyance or discomfort. Blackstone has said that a nuisance "is anything that worketh hurt, discomfort or damage." Another noted lawyer has said "a nuisance is whatever the courts find is a nuisance."

Section 152 of the Massachusetts General Laws, Chapter 111, relating to offensive trades, and which in part dates back to 1710, links public health, comfort, and convenience, while Section 143 on the same subject, dating back to 1692, authorizing local departments of health to assign places for carrying on offensive trades links nuisances with matters "hurtful to the inhabitants, injurious to their estates,

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

dangerous to the public health," and those "attended by noisome and injurious odors." The sanitary inspector must consider the magnitude of the offensive condition, the distance to habitations, its frequency and duration, and the unreasonableness of the use of the property before the condition is determined a nuisance. The results of the control of a nuisance while beneficial to the complainants are not spectacular like the correction of a sudden infection of a water supply or the prevention of other forms of infection resulting in an epidemic.

The late George C. Whipple gave much thought to sanitation and its relation to health and life. He felt that sanitation would always be the foundation of sound public health. Many of Professor Whipple's ideas were presented in a paper before the Sanitary Engineering Division of the American Society of Civil Engineers on January 15, 1924.² Another paper of interest on the subject is that of L. L. Tribus on "Odors and Their Travel Habits."³ Still another is that of C.-E. A. Winslow on "The Atmosphere and Its Relations to Human Health and Comfort."⁴ In fact, the American Society of Civil Engineers in January, 1925, held a symposium on the detection and elimination of odors.⁵ In this symposium the law on nuisances is expounded by Irving I. Goldsmith, then Deputy Attorney General of New York. He refers to a decision of the United States Supreme Court⁶ which contains the following statement:

... it has been the settled law, both of this country and of England, that a man has no right to maintain a structure upon his own land, which, by reason of disgusting smells, loud or unusual noises, thick smoke, noxious vapors, the jarring of machinery or the unwarrantable collection of flies, renders the occupancy of adjoining property dangerous, intolerable or even uncomfortable to its tenants. No person maintaining such a

nuisance can shelter himself behind the sanctity of private property.

In summing up Mr. Goldsmith states that,

... The law seems to be adequate to protect the public welfare and enjoyment of property, but resort to the Courts for relief appears to be on the wane for the reason that the skill and ingenuity of the Engineering Profession are eliminating the causes which contributed so largely to the undesirable and unhealthy odors and vapors permeating the air in and about cities and villages. . . .

The control of a nuisance may often be a matter of common sense, but of course the remedy in many instances requires the attention of a sanitary engineer. The health departments in most of the larger cities now have a sanitary engineer on the staff, but the health departments of towns rarely can finance a man as a sanitary inspector of more than high school training, and this service of the local department of health has not been kept so much on the up grade as the other branches. Practically all of the state departments of health, however, now have sanitary engineering divisions and these engineers are equipped to assist the local boards of health in the control of the more complicated nuisances.

As the matter is handled in Massachusetts, a nuisance problem comes before the local board of health first probably by verbal complaint which may rightfully be ignored, and later by signed written complaint which results in an examination by the sanitary inspector. In the large majority of cases, where spite is not involved, the sanitary inspector can readily control the situation either by having the nuisance abated or by making recommendations as to its control. The state department does not go into the matter except to advise the local department upon request or until the local remedies are exhausted, or where two municipalities are involved.

One of the most notable examples involves the intensive industrial district in Everett, Mass., about which complaints have been made by citizens of Everett, Chelsea, Revere, Malden, Medford, Somerville, Cambridge, Arlington, Watertown, and parts of Boston. The causes of these complaints were the odors produced by the very active industries engaged in the refining of oil, the manufacture of various chemicals, particularly sulphuric acid, the manufacture of illuminating gas, and the manufacture of varnish. The first complaint was made in regard to the gas works over 30 years ago. In 1913, in 1922-1923 and again in 1926, numerous complaints were registered with the local departments of health and with the state department. Various improvements were made in the manufacturing processes from year to year, and when the odor elimination devices were given suitable attention, the complaints died out, but as carelessness crept in, objectionable conditions again appeared. In 1932, the Legislature passed a resolve directing the Massachusetts Department of Public Health to investigate the causes of the offensive odors in this district; to determine the effect, if any, upon the public health; and to report the matter to the next session of the Legislature. During the long period of intermittent investigation before the passage of this resolution the matter was taken to the Supreme Court of Massachusetts and the following is quoted from the decision:⁷

... The defendant (Beacon Oil Co., Everett, Mass.) is engaged in a lawful business in the conduct of which it is found that odors necessarily will escape into the air; but it also appears that the defendant has adopted the most approved methods and devices to control and confine such odors at an expense of many thousands of dollars; it also is further found that such odors would not be unbearable or injurious to the health of normal persons. . . . Whether there is a

nuisance in a certain locality depends upon the attendant circumstances, including the character of the neighborhood, the acts complained of and their effect upon the comfort or health of people in general. The district where the defendant's plant is situated has for many years been increasingly devoted to manufacturing purposes; some of the plants were there located many years ago, and from some of them odors are thrown off at times which are offensive and disagreeable, but as those discharged by the defendant are not injurious to the lives or health of normal persons, it cannot be held that a nuisance exists in view of the findings of the master to the contrary.

It is a matter of common knowledge that in thickly settled manufacturing communities the atmosphere is inevitably impregnated with disagreeable odors and impurities. This is one of the annoyances and inconveniences which every one in such a neighborhood must endure. Mere discomfort caused by such conditions without injury to life or health cannot be ruled as matter of law to constitute a nuisance. Each case must depend upon its own facts and no rule can be formulated which will be applicable to all cases. *Rogers v. Elliott*, 146 Mass. 349. *Downing v. Elliott*, 182 Mass. 28. *Stevens v. Rockport Granite Co.*, *supra*. . . .

In the course of the department's investigation⁸ the amount of sulphur dioxide in the air was determined by means of an adaptation of the Palmer dust apparatus operated from a special storage battery with a rotary converter, all carried in an automobile. Of 103 determinations, 31 per cent contained 0.001 mg. or more of sulphur dioxide per liter of air, the highest determination being 0.00897 mg. at a point 0.6 mile from the oil refinery. Careful observations for odors were made in the surrounding territory on the leeward side of the various industrial plants throughout much of the time covered by the investigation—June 27 to November 21, 1932. The time when an odor was noticed was recorded together with the distance from the probable source where it was offensive, and where it was noticeable. The reports also contained information kept

to the character of the odor, the probable source, the mean temperature, the relative humidity at 12 M., and the average wind velocity.

The department was required to determine the effect of the odors upon the public health and comfort and it attempted to detect any possible menace to the public health in Chelsea, Everett, and adjacent areas by studying the data on general death rates, infant death rates, respiratory disease death rates, as well as chronic disease death rates in these and in control areas. This study showed no evidence of any menace to the public health in Everett and Chelsea and the adjacent areas due to the industrial odors, fumes, and gases. Certain of the data in fact were more favorable for these areas than in other industrial areas in the state used as controls. The department obtained information, however, showing that the public comfort in parts of the municipalities was affected by the odors.

During the investigation covering 5 months, only 3 complaints were made to the department of industrial odors, fumes, and gases, and it thus appeared that due to increased vigilance on the part of the plant operators, probably effected by the presence of the department's agents, the odors were kept under reasonable control. Each of the large industrial concerns involved was equipped with a research department engaged from time to time in the development of odor control improvements, and through the efforts of the department various additional improvements were suggested which appeared to effect an improvement. The final result of the investigation was the suggestion that the scientific personnel of the various large concerns in this district continue to devote such time as is necessary to the investigation of odor control devices and to their operation. Most of the industrial concerns

in this region are still in operation but the department has received no complaints for some years.

It is impracticable in this paper to list all of the matters pertaining to nuisance control which require the attention of sanitary inspectors. Rosenau gives the following¹:

- filth
- garbage
- ashes
- slops
- cesspools
- privy vaults
- sink drains
- dumps
- wet and soggy lands
- defective plumbing
- faulty cellars
- overcrowding of tenements
- weeds
- railroad toilets
- salt used on streets in snowy weather
- spitting in public places
- keeping of horses, cattle and swine
- dead animals
- stagnant water

To this list should be added smoke, dust, flies, and mosquitoes.

Of the above list, the matters other than those having to do with sewage disposal, flies, mosquitoes, defective plumbing and overcrowding of tenements probably have comparatively little to do with communicable diseases, but where cesspools overflow onto the surface of the ground, where privies are open to flies and where malaria is present, conditions dangerous to the public health may easily result.

There are many publications on methods of rural sewage disposal. Probably one of the best is *Farmers' Bulletin 1227* of the U. S. Department of Agriculture. On March 26, 1937, the U. S. Department of Agriculture, Resettlement Administration, issued a paper on "Standard Methods and Designs for Sewage and Waste Disposal Installations on Land Development Projects," which is excellent. It goes into the design and construction of

privies, cesspools or leaching pits, septic tanks, Imhoff tanks, sand filters and other methods of sewage disposal. Years of experience have shown that many individuals believe septic tanks to be a cure-all for sewage disposal problems. In fact, certain sanitary engineers feel that when a properly designed septic tank has been constructed the local sewage disposal problem is solved. Septic tanks unquestionably are of value as a preliminary form of fresh sewage treatment but as average domestic sewage is generally over 95 per cent water some means of disposal of the effluent is much more important than the design of the septic tank, and they accordingly should be considered only as a preliminary means of treatment before discharging the effluent into cesspools or sub-surface distribution pipes properly laid in and surrounded by crushed stone or coarse gravel. These distribution pipes should be of adequate length, 20 to 100 ft. per person, depending upon the character of the soil. In designing or constructing a cesspool, information must be obtained first as to the character of the soil and depth to ground water. The location in relation to sources of water supply is of importance, and if 2 or more cesspools are required the effluent from the first should be piped through an elbow or tee taking off from below the flow line. Grease traps are important where kitchen wastes are to be treated.

In the rules and regulations adopted by the Massachusetts Department of Public Health for the sanitary protection of water supplies, no cesspools or other means of sewage disposal are permitted within 50 ft. of the high water mark of any source of water supply or tributary thereof, nor within 250 ft. unless such receptacle is so constructed that no portion of its contents can escape or be washed into such waters. Other rules and regulations

provide that means of sewage disposal should be at least 100 ft. from any pond where bathing is permitted, and at least 200 ft. from any well or spring.

In the construction of a privy, consideration should be given to having the vault water-tight and easy of access so that it can be cleaned when required. The privy should be rain-proof, rat-proof, and fly-proof, located inconspicuously and remote from any water supply. If at no great distance from a well, it should be located at an elevation below the bottom of the well. The contents should be disposed of at places selected by the local health department.

In certain Massachusetts municipalities where difficulty has been experienced in the disposal of night soil, arrangements have been made to convey this material to the nearest municipality having a sewerage system whence it is discharged through man-holes or suitable hoppers, generally with screening devices, into the system. In the construction of the sewerage system of the city of Lynn, Mass., a hopper was provided near the sewage pumping station whereby any night soil or similar sewage material could be discharged through a screen into the sewerage system. This arrangement of conveying the night soil to an adjacent sewered municipality has been consummated in one of the municipalities not having a sewerage system which is located on the watershed of one of the larger water supplies.

Public dumps probably cause as many complaints to the local board of health as any other one subject, due particularly to dust, rats, flies, cockroaches, smoke, and foul odors. The owner, agent, or lessee of any land or enclosure used as a dump, should cause all offensive matter dumped thereon to be immediately covered to the satisfaction of the sanitary inspector, and all other refuse matter should be kept

leveled. Regulations should be adopted whereby no person may dump any offensive material upon any dump unless permitted to do so by the board of health, and all possible care should be used in preventing the escape of dust and papers from the dump or the vehicles used in conveying waste materials to the dump.

Of course, it is impracticable wholly to prevent dumping of foul materials. Individuals sometimes convey waste materials from one municipality into another and in several cases detective work has disclosed tags or other information indicating the source from which the material came.

Dump fires are the cause of considerable offense. The writer has seen smoldering dumps even when they were covered with snow. Experience has shown that the most successful way of combating such a fire is to overhaul the dump by digging trenches with a tractor or steam shovel, and to use a hose stream horizontally. This method has been successful in a dump fire where enormous quantities of used rubber smoldered for several months causing a nuisance in two or more municipalities.

Piggeries have caused considerable difficulty in various suburban municipalities, but the cause is largely with the owner rather than with the swine. If the piggery is suitably isolated and properly controlled, the offensive odors are not likely to cause complaint. It is desirable that the piggery be located on isolated land having a southern exposure where the underlying soil is reasonably porous. An adequate water supply for cleaning should be provided and properly ventilated buildings of substantial construction, preferably painted white and well lighted, should be used. Feeding platforms should be on skids so that they can be readily moved and the ground about the earlier location should be plowed in. A

bin for receiving the garbage should be provided and this should be covered during the warm weather. Garbage cans, wagons, and trucks should be thoroughly washed before they are taken away. Uneaten garbage and manure should be composited with earth and care should be taken when this material is used for fertilizer to plough it into the ground as soon as possible.

The rules and regulations adopted by the Massachusetts Department of Public Health for protecting sources of public water supply provide that no piggery shall be located or maintained within 50 ft. of any source of water supply or tributary thereof nor within 250 ft. thereof unless suitable and adequate provision is made to prevent any polluting matter from flowing or being washed into the water supply. Many of the Massachusetts municipalities have rules and regulations under which swine may be kept only by a permit of the local board of health, which may be revoked at any time for cause.

The keeping of swine has been determined by the Massachusetts Supreme Court as an offensive trade. Others are listed below:

Rendering works	Liquor distilleries
Soap works	Breweries
Slaughter houses	Abattoirs
Oil refineries	Tanneries
Fish handling plants	Varnish works
Glue works	Rubber works
Gas works	Smelters

In the control of offensive trades, the sanitary inspector should aim to regulate rather than to destroy excepting in the comparatively few instances where the business must be absolutely prohibited. Most offensive trade odors can be destroyed by burning under the boilers, by scrubbing with water, or by treatment with chlorine. The Cottrell Electrical Precipitation process whereby solid or liquid particles carried in sus-

pension are removed from gases by a strong electric current has been successful with many industrial odors.

The most important apparatus to determine an odorous nuisance is the human nose used with sufficient patience, and it has been said that a normal person can detect one gram of hydrogen sulphide in 1,000,000,000,000 c.c. of air while mercaptans can be detected 25 times more readily.

Hiscock⁹ gives a budget for the Bureau of Sanitation in a municipality of 100,000 population, to consist of a director, three district inspectors and a clerk with maintenance at a total of 9 to 11.6 cents per capita per year. He states¹⁰ that according to present standards there may be expected 3,000 sanitary inspections and reinspections per 100,000 population per year with abatement in 80 per cent of the cases.

The Massachusetts law on nuisances, General Laws, Chapter 111, Section 122, which was first adopted in partial form at least in 1797, makes the following provision:

The board of health shall examine into all nuisances, sources of filth, and causes of sickness within its town, or on board of vessels within the harbor of such town, which may, in its opinion, be injurious to the public health, shall destroy, remove, or prevent the same as the case may require, and shall make regulations for the public health and safety relative thereto and to articles capable of containing or conveying infection or contagion or of creating sickness brought into or conveyed from the town or into or from any vessel. Whoever violates any such regulation shall forfeit not more than one hundred dollars.

It is interesting to note that the local board of health is *directed* to examine into all nuisances and *shall* destroy, remove, or prevent the same. The Massachusetts law makes no provision for an appeal from the local board of health to the State Department of Public Health, but Section 141 provides that—

Whoever is aggrieved by the neglect or refusal of the board of health to pass all proper orders abating a nuisance, in accordance with any provision of sections one hundred and twenty-two to one hundred and thirty-nine, inclusive, may apply to the county commissioners, who may hear and determine such application and exercise in such case all of the powers of said board. The applicant shall, within twenty-four hours after such neglect or refusal, file with said board a written notice to the adverse party of his intention so to apply to the county commissioners, and within seven days after the filing of said written notice shall present a petition to one of the county commissioners, stating the grievance complained of and the action of the board of health thereon or the neglect or refusal of said board to act thereon, as the case may be. (Chapter 278 of the Acts of 1937)

Hiscock¹¹ points out that the sanitary inspector should strive for a close working relationship between his department and the building and plumbing departments. The collection and disposal of garbage and refuse like the collection and disposal of sewage should be handled by one of the engineering departments of the city rather than by the health department, though the health department, which will doubtless receive most of the complaints due to faulty garbage collection and inadequate sewerage, should be familiar with the procedure as carried on by the engineering department, and should have a hand in preparing the rules and regulations under which the garbage is collected and disposed of.

The collection and disposal of sewage and the distribution of a safe water supply obviously have a more vital relation to the prevention of sickness than does the collection and disposal of garbage and refuse. The writer, in 1932, pointed out that the cost of refuse and garbage disposal for 39 cities in 1930 exceeded the total expenses of the 39 health departments by 12 per cent, and that in 15 of the larger municipalities the refuse and garbage collection and disposal costs in 1930 were

93 per cent of the entire expenses for public health in these municipalities.

Water works are financed on a quantity consumed basis, and in an increasing number of municipalities the use of sewers is paid for on an annual rental basis determined by the amount or character of sewage discharged—which in most instances is a proportion of the water bill based on definite measurements. A service charge based upon the quantity or weight of refuse and garbage collected by the municipality would appear to be a matter for consideration. A board of health in attempting to increase its budget for garbage and refuse collection is likely to be faced with the problem of reducing its budget for more important health activities which should not be curtailed. A service charge would overcome this difficulty.

The late Dr. George H. Bigelow, stated at the meeting of the Massachusetts Association of Boards of Health, that boards of health in certain Massachusetts municipalities were ordering tuberculous patients out of sanatoria at the end of short periods and in some cases refusing to admit new patients, while these same boards of health were spending lavishly to collect garbage, refuse, and ashes which, he stated, have no relation to disease or health, at least in the northern part of the country.

The question of paying for garbage and refuse collection service on a quantity or weight basis rather than from the tax levy might also have the effect of cutting down the quantity particularly of garbage, as has been experienced with water when it has been metered.

Perhaps the most important work for the sanitary inspector is that of education. Progress cannot be made any faster than demanded by the public, and the greatest satisfaction in an educational campaign on the improvement of sanitary conditions undoubtedly relates to the adoption of suitable means for garbage and refuse disposal and the extension of municipal water supply and sewerage systems. Therefore, every opportunity should be used to secure the completion of the municipal water distribution and sewerage systems and the adoption of suitable means of garbage and refuse disposal.

REFERENCES

1. Rosenau, Milton J. *Preventive Medicine and Hygiene* (6th ed). p. 665.
2. *Transactions, American Society of Civil Engineers*, 88:87, 1925.
3. *Ibid.*, 85:378, 1922.
4. *Ibid.*, 89:316, 1926.
5. *Ibid.*, 89:339, 1926.
6. *Camfield vs. United States*. U. S. Supreme Court Reports, 167 U. S. 518, 1897.
7. *Massachusetts Supreme Court Reports*, 251 Mass. 479, 1925.
8. *House Document 1171 of the Massachusetts Legislature of 1933*.
9. Hiscock, Ira V. *Community Health Organization*, 1932, p. 173.
10. Hiscock, Ira V. *Ibid.*, p. 170.
11. Hiscock, Ira V. *Ibid.*, p. 169.

Microbial Flora of Paper Containers^{*}

FRED W. TANNER, F.A.P.H.A.

*Laboratories of Bacteriology of the University of Illinois and
American Can Company, Maywood, Ill.*

PAPER has played an important rôle in storage and transportation of foodstuffs for many decades. Despite the fact that other materials have also been developed for these purposes, treated paper seems to be holding its own, and in some cases to be making great advances. Each material developed for container manufacture has its merits. Paper containers have one distinct advantage over others—they are used but once, and therefore do not present the sanitary hazard inherent in those which are used many times. The one-service container obviates the inconvenience and expense connected with pick-up, washing, and sterilization.

As early as 1908 the advantages¹ and disadvantages of the paper milk bottle were discussed. It was claimed that the paper bottle would reduce the cost of delivery and reduce the possibility of spreading communicable diseases, which may be a serious problem. Before discussing the merits or demerits of a new container for fluid milk, it is wise to appraise the one now in use. Only its public health aspects need be considered. Glass bottles of all types are fomites which may disseminate undesirable bacteria. Hunt² attributed

infection of a milk supply to bottles picked up from homes in which cases of communicable disease existed. Gibbs-Smith and Hobday,³ after infecting milk with *Eberthella typhosa* and placing it in glass bottles, were able to isolate the organism from 2 of 4 bottles after cleaning. If it is possible to substitute a one-service container, a distinct advance will have been made in distribution of one of our most perishable foods.

Cleaning and sterilization of the glass bottle has been studied by milk plant technologists. It has been quite satisfactorily established that there is a lack of relationship between the appearance of a bottle and its microbial load. A major problem is to tell when a glass bottle is clean and satisfactory, largely due to lack of adequate methods in the laboratory for removing bacteria from the inside of the bottle so that they may be counted. A committee of the American Public Health Association (Holmquist, *Chairman*, 1934)⁴ tried to define clean, sterile utensils. Milk bottles were considered at some length. A state health department is quoted as finding 22.6 per cent of 1,820 bottles with counts in excess of 10 per c.c., and 43.1 per cent in excess of 1 per c.c. capacity. Layson, Huffer, and Brannon⁵ found the bacterial content of washed and "sterilized" glass bottles quite variable. In any case of 12 bottles, 2 or 3 might be sterile, at least

^{*} Read at a Joint Session of the Laboratory and Food and Nutrition Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 1, 1937, and the Fall Meeting of the Society of Illinois Public Healthists in Urbana, Ill., October 23, 1937.

yield no bacteria in a rinse test, while others might yield as many as 180,000 to 200,000 per bottle. High counts were secured from some bottles which looked clean. Gas forming bacteria were found in 14.5 per cent of all bottles examined. The results reported by these investigators, if representative for other dairy plants, indicate that problems relating to bottle cleaning and sterilization have not been entirely solved.

Several authorities have attempted to establish bacterial standards for satisfactorily cleaned and sterilized milk bottles. The International Association of Milk Dealers⁶ required that such a bottle give counts of not more than 2 colonies per c.c. capacity. *Standard Methods of Milk Analysis* (Sixth Edition, 1934, p. 58) in a tentative method for testing sterility of glass bottles provides for not more than 1 colony per c.c. as determined by rinsing the bottle with 100 c.c. of sterile water. This would mean a standard of not over about 1,000 bacteria per bottle. It is necessary to keep these facts in mind when appraising the paper milk bottle.

We may now proceed to appraise paper containers for distribution of fluid milk. Attempts to develop a satisfactory paper container are not new. For some 30 years, if not longer, more or less interest has been exhibited in this possibility. It remained, however, for bottles developed since about 1929 to appeal to any extent to health officers and dairymen. All of our work has been done with one type of container, but since it is made of paraffined paper board, we believe that our experience is little different from that which would be secured with other containers of similar manufacture.

Paulsen⁷ reported that certain Danish dairies were delivering milk in cardboard bottles which had been paraffined inside and outside at a temperature of about 105° C. (221° F.).

Milk from the paper bottles was said to be on the whole bacteriologically equal to that stored in glass bottles sterilized by steam or chlorine, and was vastly superior to milk stored in only well washed glass bottles. The cardboard bottles were absolutely air-tight and did not affect the taste of the milk.

Paper containers for various foods have not been subjected to careful bacteriological examination to any extent despite the fact that they have been used for many years. In most cases their bacteriological condition has been taken for granted. Dudderidge⁸ made such examination after pointing out that the paper used in such dishes was waste paper frequently of questionable origin and cleanliness. She also stated that water-proofing materials might make it easier for bacteria and dirt to stick to the bottle. Her technic consisted in placing the entire dish to be examined in a wide-mouth stoppered bottle containing sterile water and sterile shot. The bottle was then thoroughly shaken and the rinse water plated. A wide variety of microorganisms was isolated including staphylococci, chromogenic organisms, and yeasts. *Escherichia coli* was isolated from one paper dish and one wood-pulp dish. From 400 to 700 bacteria were reported per dish. Wooden dishes yielded fewest organisms.

Rice⁹ was led to study bacteria on milk bottle caps by fluctuating counts in pasteurized milk and appearance of sweet curd milk. Rice examined paper board caps used for closing the bottles. The caps were received in sealed tubes, opened in the laboratory, and every 50th cap selected for examination. The culture plates were prepared by covering the bottom with about 10 c.c. of melted agar which was allowed to harden. The cap was placed on this and 10 c.c. more of melted agar poured over it. This technic soon showed that the cap might be a source of bacteria.

Caps of all manufacturers were quite alike in this respect.

The types of bacteria were somewhat varied and according to Rice were saprophytes of no sanitary significance. The simpler the cap, the fewer bacteria were found. Bacterial growth always developed from the margin of the cap except where the paraffin was broken. Rice believed that the bacteria found were related to the manufacture of the paper-board itself. In order to prove this, Rice had a manufacturer cut pieces of paper-board with sterile instruments and ship them to him under sterile conditions. Bacteria were found especially common in samples the edges of which had been frayed and torn. While it was believed that paraffining caps might eliminate the bacteria or prevent them from entering the milk, just the opposite effects were secured—more bacteria appeared about the edges of the caps. It was explained that the hot paraffin had driven them from the center of the cap to the edge. Rice¹⁰ reported further on the source and origin of bacteria on caps. Aseptic specimens were collected at 2 paper-board manufacturing plants, both of which were using imported sulphite pulp and a domestic pulp board. These were thoroughly mixed in the beaters. Acid sizes caused a greater reduction in bacteria than more alkaline sizes. The heat on the paper making machine contributed greatly to reduction of bacteria. Contaminated water used at the calender stacks gave a public health aspect to the problem. Purification of this water caused a reduction in bacteria on the caps. The finished caps were found to be frequently contaminated by the chip-board tubes in which they were shipped and Rice advised use of cap-board for the tubes.

In another investigation paper milk bottles from 4 different manufacturers were examined bacteriologically by

Rice.¹¹ The bottles were filled with pasteurized milk under commercial conditions, milk in glass bottles being used as controls. One hundred and thirty-five bottles were filled with sterile water and, after incubation at 37° C. for 6 hours, the water was plated. Rice did not use the present methods of rinsing the bottles with sterile water and, consequently, it is difficult to determine the exact bacterial load in the bottles. He believed that bottles made and sealed in the factory were better than those shaped and finished in the dairy.

A Conference on Sanitation of Paper Milk Containers held at the New York Agricultural Experiment Station at Geneva, N. Y., on July 12, 1937, considered all problems relating to manufacture and use of paper milk bottles. This Conference was attended by 60 or 70 individuals representing paper companies, container manufacturers, and health officers. Breed¹² summarized the action of the Conference. Those who are especially interested in paper milk bottles should by all means read this report. This Conference gave special attention to bacteriological examination of paper containers and specified that the latest standard methods of milk analysis recommended by the American Public Health Association should be used. Quart containers were to develop not more than 1,000 colonies; pint containers, not more than 500 colonies; and half-pint containers, not more than 250 colonies. These were said to be in accord with the standards suggested by the American Public Health Association for glass bottles.

While paper stock of questionable origin may have been used for manufacture of some food containers, this is not the case for milk bottles now being manufactured. Only virgin chemical or mechanical pulp is being used, which contains very few microorganisms since the treatment given it

makes it impossible for many micro-organisms to survive. Those which do appear are harmless saprophytes. Anyone familiar with methods of paper making realizes how difficult it is for bacteria to survive chemical and heat treatment which is given the pulp on its way from the heaters to rolls of finished paper. To produce paper of satisfactory sanitary quality it is necessary to use pure virgin pulp, and to handle it in pure water treated, if necessary, by filtration and chlorination. The moisture content of the web of paper leaving the last press for the first dryer is about 75 per cent. The temperatures attained on the drying rolls are such that living bacteria are greatly reduced in numbers. Few survive, and it is probable that paper manufacturers in the near future will supply sterile paper board. Sanborn¹³ has pointed out some necessary improvements. Some of the bacteriological problems inherent in paper containers for foodstuffs are apparent. Their significance must be weighed, however, only in relation to other sanitary features. Conclusions reached as to their merits must be algebraic sums of all factors involved in production and distribution of foodstuffs not only in them but in other containers.

The first situation which an appraisal of paper milk containers from the bacteriological standpoint brings to mind, is the paper-board stock from which they are made. Distribution of such a perishable food as milk in paper bottles has given all such containers new interest. Manufacturers realize that new problems have been added. They must consider the public health aspect of their industry and furnish a product which will meet the requirements of a rigorous health protection program.

The first problem for a bacteriologist is selection of a method. Obviously the

interior of the bottle is most important because only that portion contacts the milk. Methods may be grouped as follows:

1. Rinsing Methods—These methods have been used by many investigators. *Standard Methods of Milk Analysis* (Sixth Edition, p. 58), lists a tentative rinse method for testing sterility of milk bottles. One hundred c.c. of sterile water are introduced into the bottle, the bottle capped, and shaken vigorously to wet the entire surface of the bottle. Two 1 c.c. portions are then plated on plain agar. The number of colonies developing on each plate multiplied by 100 equals the estimated number of colonies per bottle. In our early work, Dr. Wheaton tried a 10 c.c. rinse and found it had considerable merit. He called attention to the fact that a 1 c.c. portion of 100 c.c. rinse water might introduce a great error, for it might not be a truly representative portion, and suggested that the entire 10 c.c. be plated either in 3 plates or in 1 plate. Dr. Tiedeman suggested this modification in a report before the Public Health Engineering Section. This means that a little less than 9.5 c.c. will be removed from the rinsed bottle.

Another method using sterile skimmed milk in place of sterile water has been used by Clark. It was believed that sterile milk might wet the paraffin surface more efficiently than sterile water and thus remove more bacteria. While this seemed to be the case, the plates were so opaque that it was difficult to count the colonies. It was noticed in practically every trial that many more bacteria were demonstrated to be present.

Plain broth was also used by Clark. It was plated in the usual manner, and had the advantage of removing more bacteria from the paraffin surface than water.

II. Direct Examination Methods—

Another method is one which has been used by bacteriologists in different fields. It involves introduction of the fluid agar medium into the bottle, shaking thoroughly, and either coating the interior of the bottle with a layer of agar or allowing it to harden in the bottom of the bottle. After incubation the colonies may be counted. This is probably not a good routine method to be used in different laboratories. It is difficult to count colonies, for spreaders may interfere.

Speck and Black¹⁴ found the swab method more practical for the examination of open-top paper containers than rinse methods. They swabbed the surface with one moist and one dry swab. After use, the swab was thoroughly broken and disentangled in a 40 c.c. dilution blank. This technic would be especially suitable for open-top containers but might have decided limitations with containers that are practically closed.

After examining thousands of bottles both during development and after they had been subjected to practical use on a large scale in the New York Metropolitan District, we are convinced that a rinse test is best for routine purposes. This method may not indicate all the bacteria present, but when carried out under standard conditions yields satisfactory results, and indicates quickly whether a container is reasonably free of microorganisms.

When investigations were first started on a container for fluid milk made from paraffined paper-board, it was believed that hot paraffin at a temperature of 82.2° C. (180° F.) would yield a sterile surface. Early work soon proved this expectation to be unfounded, and it has been proved beyond doubt that paraffin is not a sterilizing agent. Paraffin does, however, play an important rôle in manufacture of a container

for fluid milk and has many fine qualities. When applied at 82.2° C. (180° F.) it causes a marked reduction in numbers of viable microorganisms. It also prevents many bacteria from gaining access to the milk by entraining them. These observations on the finished milk bottle are supported by many data collected with pure cultures of microorganisms in hot paraffin.

One of the first questions asked about paper milk bottles is, "Are they sterile, and if not what are their bacterial loads, and what types of bacteria are present?" Over 90 per cent of the bottles which we have examined yield no bacteria to sterile rinse water when examined according to the method given in *Standard Methods of Milk Analysis*. This probably does not mean that all of them are free of bacteria but that the rinse test did not show their presence. Most of the bottles which show any bacteria contain fewer than 10 per bottle. A few have given higher counts, such as 190, 70, 80; but the counts have always been well within any standards which have been proposed for glass bottles. The types of microorganisms are not especially significant—sarcinae, white staphylococcus, aerobic spore-forming rods, and non-spore-forming rods. Molds have been encountered in a few bottles. The organisms present are harmless saprophytes apparently picked up by the paper and paraffin.

Over 1,200 bottles were examined in one series for presence of *Escherichia coli* by placing 5 c.c. of the rinse water in sterile lactose broth. The organism was never found.

CONCLUSIONS

1. The average bacterial content of paper milk containers for distribution of fluid milk is much lower than the counts which have been reported for some glass bottles. They are usually less than 10 per bottle.

2. The types of bacteria are usually sarcinae, white staphylococci, aerobic spore-forming rods, and non-spore-forming rods. Such organisms are of no sanitary significance.

3. Methods of making paper-board, while not always yielding a sterile product, cause a profound reduction in numbers of viable bacteria.

4. Water-proofing the paper-board with hot paraffin also contributes a marked reduction in viable bacteria.

5. The bottles studied in this investigation were made and sealed in the factory. That part which comes into contact with the milk is not exposed to contamination, for the containers are not opened until they are about to be filled.

6. The paper container studied in this investigation represents a distinct advance in methods for distribution of fluid milk. It obviates collection of used containers from homes of all grades of cleanliness, and prevents re-use of bottles which have been misused.

REFERENCES

1. *Maritime Farmer*, 14:70-71, 1908.
2. Hunt, A. C. Milk Bottles and Typhoid Fever. *Ann. Rep., Bd. of Health*, New Jersey, 35:101-113; Rev. in *Exper. Sta. Rec.*, 28:879, 1911.
3. Gibbs-Smith, E. G., and Hobday, F. Milk Bottles as a Possible Cause of Epidemics. *Vet. J.*, 84:503-507, 1928.
4. Holmquist, C. A. (Chairman). When Are Milk Containers and Equipment Clean and Sterile? *A.P.H.A. Year Book*, 1933-1934. Supplement to *A.J.P.H.*, 24:72-74 (Feb.), 1934.
5. Layson, S. V., Huffer, E. G., and Brannon, J. M. Results of Bacteriological Survey of Milk Jugs and Milk Bottles. *Milk Plant Month.*, 25: 34-36, 90, 1936.
6. International Association of Milk Dealers. *Lab. Manual*, 1933, pp. 72-73.
7. Paulsen, V. Delivery of Milk in Bottles or Cardboard Boxes. *Ugeskr. f. Læger.*, 98:57-58, 1936. Rev. in *Bull. Hyg.*, 11:400, 1936.
8. Dudderidge, M., Paper Dishes—Bacteriology. *Housewives League Mag.*, 5:12-15, 1915.
9. Rice, J. W. Bottle Caps as a Source of Contamination of Milk. Penn. Assn. Dairy and Milk Insp., 6th Ann. Rep., 1930, pp. 1-18.
10. Rice, J. W. The Source and Control of Bacteria in Milk Bottle Caps. Penn. Assn. Dairy and Milk Insp., 8th Ann. Rep., 1932, pp. 19-30.
11. Rice, J. W. The Bacterial Content of Paper Milk Bottles. Penn. Assn. Dairy and Milk Insp., 11th Ann. Rep., 1936.
12. Breed, R. S. Conference on Sanitation of Paper Milk Containers. New York Agr. Exper. Sta., Geneva, N. Y., July 12, 1937. *The Milk Sanitarian*, 6:11-13, 1937.
13. Sanborn, J. R. Microbiological Control in the Manufacture of Paper Wraps and Containers for Food. *Indust. & Eng. Chem.*, 29:949-951, 1937.
14. Speck, M. L., and Black, L. A. Effectiveness of Cotton-Swab Methods in Bacteriological Examination of Paper Ice Cream Containers. *Food Research* 2.

Diagnosis of Industrial Skin Diseases*

LOUIS SCHWARTZ, M.D., F.A.P.H.A.

Medical Director, U. S. Public Health Service, New York, N. Y.

IT is important to determine whether a dermatitis from which a worker is suffering is of industrial origin—(1) because it has a direct bearing on the treatment of the case and on the prevention of its recurrence; (2) because of the compensation involved; and (3) in order to determine who pays the physician's fee.

If it can be determined that the dermatitis is due to exposure to certain occupational skin hazards, then the major portion of the treatment consists in preventing further contact with these hazards, that is, removing the patient from his working environment, or providing him with suitable protective clothing. In these cases the prevention of the recurrence of the disease consists in preventing contact with the offending material either by methods stated above or by installing proper safety measures, such as totally enclosed processes, adequate ventilation, clean work rooms, clean clothing, etc.

The compensation laws in many of the states are so worded that if a physician undertakes to treat a worker and he makes a diagnosis that the disease is of industrial origin, then his fee is practically taken care of either

by the compensation commission or by the insurance carrier. But, if after treating the patient, the physician should determine that the dermatitis is not of industrial origin, the employer or insurance carrier will not pay for the treatment, and the physician must look to the patient for his compensation. You can readily see that this has a tendency to make the physician lean toward a diagnosis of industrial dermatitis because very often his chances of being paid a fee by the poor worker is uncertain. It is to the advantage of insurance carriers and compensation boards to devise means to remedy this condition.

There is no one factor upon which a diagnosis of industrial dermatitis can be made. In most instances the appearance of the lesions gives no clue to the irritant. Especially is this so in the acute and chronic eczematoid types of occupational dermatoses. All of the following factors must be considered and each one forms only a link in the chain of evidence on which a diagnosis of industrial dermatitis should be made:

1. *History*—The history of the dermatitis is most important. In order for the dermatitis to be considered as of possible occupational origin, it must be brought out that such a dermatitis was not present before the patient entered on the occupation. It must also be shown that the dermatitis developed during the period of indus-

* Read at a Joint Session of the National Society for the Prevention of Blindness and the Industrial Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

trial exposure, or after a lapse of a reasonable incubation period since the cessation of exposure. This incubation period should not be over a week. If the history shows that other workers similarly employed are similarly affected, or that new workers at the process are usually similarly affected, then the possibility of a diagnosis of industrial dermatitis is strengthened. If the history should disclose the fact that the patient has had similar attacks of dermatitis previous to the present exposure, then the possibility of the present attack being due to his occupation is weakened, but not necessarily entirely done away with, because it may be possible that in his previous employment he may have met with the same irritant or conditions which are now causing his dermatitis. Knowledge by the physician of the working processes in which the patient is engaged and the substances with which he comes in contact is important, because this enables him to know whether the worker is exposed to known irritants or to conditions which tend to cause dermatitis. For instance, if a worker appears with a dermatitis of the hands and forearms and states that he works on a rubber mixing mill, then we know that he is exposed to irritant rubber compounds and is more likely to develop an occupational dermatitis than is a rubber worker who handles only cold vulcanized rubber objects. If the history shows that the dermatitis develops whenever the worker is at work, gets well or improves when he is away from work and again recurs when he returns to work, then the history itself establishes a definite cause and relation factor between the occupation and the dermatitis.

2. *Site of Eruption*—The site of the eruption is also important. In examining patients, they should be completely divested of clothing. This may in many cases reveal areas of dermatitis

on portions of the body not complained of by the patient and may give the clue to a proper diagnosis. Occupational dermatitis usually begins on the exposed parts—the hands, the fingers and the forearms, if the offending material is a solid or a liquid; and also on the face and neck, if it is a vapor. The covered parts of the body may also be affected, if fumes or vapors penetrate the clothing, or if the clothing is not frequently washed and becomes saturated with irritant chemicals. Thus, dermatitis may occur on the body of the worker handling irritant dusts which penetrate the clothing, such as finely powdered rubber compounds; or dermatitis may occur on the covered parts of the body when the clothing becomes saturated with petroleum oils and waxes, especially if the worker does not take daily cleansing baths and if he does not change his work clothes daily.

Occupational bacillary infections such as erysipeloid of butchers and verruca necrogencia of cadaver handlers also usually occur on the hands. The malignant pustule of anthrax among hide and leather handlers usually occurs on the head, face and arms.

Occupational dermatitis is also often found at points of friction on the body. The wrist where the ends of the gloves or the sleeves rub; the belt line where the belt or the top of the trousers causes friction; the ankle at the shoe tops; and the neck at the collar line, are all sites where friction aids the action of industrial irritants. Sometimes a dermatitis of undoubted occupational origin may become generalized. This occurs when the irritant is one to which the worker has developed a high degree of sensitivity. Many substances are known to be sensitizers. Nitro, nitroso and the chloro compounds are notorious sensitizers. In such instances a primarily localized dermatitis or burn may also sensitize the

patient and a few days later a generalized dermatitis may develop.

3. *Characteristic Appearance of Lesions*—An industrial dermatitis of the acute eczematoïd type begins as an erythema followed by papules and vesicles and, when the vesicles break, by an oozing and crusting, no matter what irritant is the cause.

Occupational mycotic infections, such as ringworm among bath attendants, barbers, beauty parlor operators, and yeast infections among cannery workers, usually occur on the hands, but the appearance is not different from that of ringworm or yeast infections of non-industrial origin.

There are, however, a few classes of industrial irritants which produce more or less characteristic lesions on certain portions of the body. Paronychia and onycholysis are common lesions among fruit and vegetable canners. The chlorinated naphthalenes and diphenyls produce acne-like lesions on the face and on the parts of the body which come in contact with the work clothes if the work clothes are not frequently washed and changed. Certain tar compounds also cause acne-like lesions on the exposed parts. Oils cause folliculitis and boils, especially on the hairy portions of the body. Paraffin, grease and tar cause keratoses to develop on the hands and forearms and these keratoses occasionally become malignant. However, the scrotal cancers reported in England as occurring among mule spinners and chimney sweeps have not been noted in this country. Certain hygroscopic chemicals, such as sugar, salt and lime which remove the water from the skin, and solvents, such as the petroleum distillates which remove the fat from the skin, may over a long period of time cause dry, fissured eczemas. Exposure to certain aniline derivatives, such as alpha naphthylamine and benzidine, are known to have caused malignant growths. Gehrmann

has reported papillomata of the bladder among the workers exposed over long periods of time to such aniline derivatives. Arsenic, especially if taken internally, has also caused new growths in the form of keratoses and epithelioma, particularly on the palms and soles. Keratotic lesions and excessive pigmentation around the face and the neck may be occupational among workers exposed to the sun, such as farmers and sailors.

Occupational dermatitis must be differentiated from such diseases as seborrhoeic dermatitis, fungus infections, lichen planus, impetigo contagiosa, pityriasis rosea, erythema multiforme, drug eruptions, neuro dermatitis and dermatitis due to contact with irritants met with outside of the place of occupation. The industrial physician or the general practitioner may at times be in doubt about the diagnosis of these conditions in a worker exposed to an occupational skin hazard, especially if he does not strip the patient and examine the entire surface of the skin, but to the dermatologist the characteristic location or appearance of seborrhoeic dermatitis, lichen planus, impetigo contagiosa and neuro dermatitis and the generalized eruptions of pityriasis rosea, erythema multiforme and drugs offer no great problem in differential diagnosis from occupational dermatitis. It is true that the presence of these conditions does not rule out the fact that an industrial dermatitis may also be present. In fact, the presence of certain of these skin diseases often predisposes a worker to an industrial dermatitis. The greatest difficulty in differential diagnosis is presented by dermatitis due to contact with substances met with outside of the place of occupation. In these cases the lesions are similar in appearance and site, and only the most careful consideration of all the facts can lead to a correct etiology. It is here

that the patch test is of greatest value.

The patch test is based on the theory that if a dermatitis is caused by hypersensitivity to a certain substance, then if that substance is applied to an area of unaffected skin of the susceptible individual and left on for a period of time, it will cause an inflammation at the spot where it touches the skin. In doing patch tests, it is important to know what concentrations of certain chemicals can come in contact with the normal skin for a stated period of time without causing an inflammation or reaction. It is also important that no general irritants, such as strong acids or alkalis are used in the patch test, because obviously they will burn any skin. The portion of the body on which a patch test is to be performed is also of importance because it has been found that the different portions may vary in sensitivity to certain chemicals. For instance, the tough horny skin on the hand is less susceptible to irritants than the more tender skin on the inner surface of the forearm. Then again, it has been found that the portion of the skin which is affected is more sensitive than other portions of the skin. For this reason, patch tests performed on uninflamed skin adjacent to the eruption are more likely to give positive reactions than when performed on more distant areas. It may even be necessary to wait until the eruption heals so that patch tests may be performed on the same portion of the skin which was affected.

If the worker is handling known irritants and his fellow workers are also affected, the cause is obvious and the patch test is unnecessary, but if he is the only one of the group who is affected, then he should be patched with the materials with which he comes in contact in the course of his occupation. If he is patched with only one substance, then a control patch should

be placed on him. If he is patched with more than one substance, then any negative reaction from one of these substances serves as a control. It is also desirable to use as a control one of the workers who has no dermatitis.

In patching with solids, best results are obtained by moistening them, preferably with perspiration from the patient which can be obtained from the axilla. Sometimes it may be necessary in order to obtain a reaction from a patch test, to use perspirations of different hydrogen ion concentrations (Ref., Schwartz, Louis. Sensitivity to External Irritants in Industry, *New York State Journal of Medicine*, 36, 24) (Dec. 15), 1936. The results of patch tests must be correlated with the worker's particular occupation, the history of the dermatitis, the site and morphology of the lesion, in order to arrive at a correct etiology. Patch tests are only a link in the chain of evidence on which a diagnosis of industrial dermatitis is made. A positive reaction only shows that the portion of the skin on which the patch was applied was at that time sensitive to the substance with which it was patched. In order to state that this substance was the cause of the occupational dermatitis, we must be sure that the patient was exposed to the substance in the course of his work and presuppose that the patient's skin was also sensitive at the time of industrial exposure.

When negative results are obtained from patch tests with the materials met with in the course of the patient's occupation, we must not hastily conclude that the dermatitis is not of industrial origin, because the skin area over which the patch was placed may not be hypersensitive, while the area covered by the eruption may be hypersensitive. Or, if the eruption has disappeared, the patient may no longer

be sensitive when the patch test is performed but may have been sensitive at the time he had the eruption and when he was industrially exposed. Or, a negative patch test reaction may be due to the fact that the patch test never accurately reproduces actual working conditions, such as friction, maceration, heat, cold, and sunlight, which may be additional factors adding to the irritating effect of the substance to which the patient is exposed. Or, it may be that the concentration of the chemicals applied as a patch test may not be as great as they actually were during industrial exposure. Or, finally, the actual industrial irritant may not have been discovered and applied as a patch test. When negative reactions are obtained from patch tests with substances encountered in the work room and the dermatitis which the worker has resembles a contact dermatitis, an effort must be made to perform patch tests with materials met with in the patient's home which may be the causes of dermatitis. For instance, certain plants, or perhaps paints or even new furniture. Tests of this kind will in some cases show that the patient is sensitive to materials met with outside of industry and not sensitive to the materials which he meets in his place of employment.

The technic of performing patch tests is important in obtaining and evaluating results. When patch testing for hypersensitivity to general irritants, such dilutions must be used in the tests as are known not to irritate the normal skin (Ref., Schwartz, Louis: Sensitivity to External Irritants in Industry, *New York State Journal of Medicine*, 36, 24 (Dec. 15), 1936. The insulating material inserted between the chemical and the adhesive plaster should be a non-irritant substance, such as unvarnished cellulose or, better still, a thin sheet of mica may be used. The resin on waterproof cellophane itself

may be an irritant as may be some of the compounds in dental rubber. The adhesive plaster used to hold the patch in place often itself causes an erythema of the skin (Ref., Schwartz, Louis and Peck, Samuel M. The Irritants in Adhesive Plaster, *Public Health Reports*, 50, 24 (June 14), 1935.

At the time the patches are removed there may be no reaction present, but some time later—a few hours to a few days—a delayed reaction may develop at the site of the patch. There is some dispute as to the significance of delayed reactions. Some hold that the skin was sensitized by the patch test but I think that in our present state of knowledge we should regard delayed reactions as denoting hypersensitivity just as undelayed reactions do. Patch tests properly performed and evaluated can be of great help in the diagnosis of industrial dermatitis, but if improperly performed and evaluated, they may lead to confusing and unjust conclusions.

Fungus infections also offer a problem in differential diagnosis from industrial dermatitis. A large percentage of workers are affected with mycotic infections in some form or other. Epidermophytosis, trichophytosis, tinea cruris and tinea versicolor are common skin diseases. Allergic reactions in the form of dermatoses on distant parts of the body resulting from these fungus infections are recognized by allergists and dermatologists. These allergic reactions or phytids may be confused with industrial dermatitis. If the phytids or the mycotic infections appear on portions of the body not exposed to industrial irritants, they are not so apt to cause doubts in diagnosis, but they often appear on the hands and here they are apt to cause trouble in diagnosis. The various tests with fungus extracts, such as trichophytin, are of little value in making a differential diagnosis because nearly every

one has or has had a fungus infection, and positive reactions are the rule. They are of more value when the tests are negative, because then they tend to show that the present eruption is not of fungus origin, although even here it is not absolute proof, because among other reasons the causative fungus may not be the one from which the testing extract is made. Then again, the fact that a worker has a fungus infection does not preclude the fact that he may also have an industrial dermatitis. In fact, it is held by some dermatologists that the presence of a fungus infection predisposes to hypersensitivity to other external irritants. Patch testing may offer some help but here again the industrial exposure, the history of the eruption, the site of the lesions and their morphology must all be carefully considered before a diagnosis is made.

Chronic eczemas, more or less generalized and of long standing offer very difficult problems in etiology, especially when they are complicated by secondary infections. Patch tests are of little value in most of these cases, because polysensitivity is usually present. It is impossible to determine whether the dermatitis and polysensitivity was caused by industrial exposure or whether the sensitivity was present before the industrial exposure or whether the dermatitis and sensitivity were caused by exposure to substances encountered outside of the work-room.

Cases sometimes appear before compensation boards claiming compensation for disability due to a dermatitis which the worker claims to have suf-

fered as a result of his occupation, but which at the time the case is being heard, has disappeared. In these cases, it is also difficult to determine the causative factor. If patch tests done at this time are positive, they are of great help, but if negative, they are not, because the patient may have developed an immunity by his recovery.

From these facts it can be seen that there is no one characteristic symptom on which a diagnosis of an industrial dermatitis can be made. The worker's occupation, the history of his skin eruption, its site and morphology and evaluation of the patch tests must all be taken into consideration by a dermatologist familiar with the substances and the processes of the worker's occupation before we can hope to make a true diagnosis as to the etiology of a dermatitis in a worker exposed to an occupational skin hazard.

REFERENCES

1. Sulzberger, Marion B., and Wise, Fred. The Contact or Patch Test in Dermatology. *Arch. Dermat. & Syph.*, Vol. 23 (Mar.), 1931.
2. Osborne, Earl D., and Putnam, Edwin D. Industrial Dermatoses, with Special References to Allergy and Mycotic Dermatitis. *J.A.M.A.*, Sept. 17, 1932.
3. Levin, O. L. Occupational Skin Diseases. *Indust. Doctor*, Jan., 1933.
4. Coca, Arthur F. Specific Diagnosis and Treatment of Allergic Diseases of the Skin. *Abst., J.A.M.A.*, 103, 17 (Oct. 27), 1934.
5. Tulipan, Louis. Problems in Industrial Dermatology. *Med. Rec.*, Nov. 21, 1934.
6. Diagnosis of Skin Disease in Industry. *Wien med. Wchnschr.*, 85:2-5, 1935.
7. Downing, J. G. The Diagnosis of Industrial and Non-Industrial Skin Diseases. *New Eng. J. Med.*, Aug. 22, 1935.
8. Fantus, Bernard, and Cornbleet, Theodore. The Causal Therapy of Contact Dermatitis. *J.A.M.A.*, 105, 25 (Dec. 21), 1935.
9. Goldwater, Leonard. Skin Manifestations of Systemic Poisons, presented at the First Symposium on Occupational Diseases, New York University College of Medicine, January 10, 1936.
10. Sulzberger, Marion B. Determining the Industrial Nature of a Dermatitis. *New York State J. Med.*, 36, 18 (Sept. 15), 1936.

Interrelationship of Health and Welfare Records and Statistics*

EWAN CLAGUE, PH.D.

*Director, Bureau of Research and Statistics, Social Security Board,
Washington, D. C.*

IN the past, records of births and deaths have been of considerable importance to welfare administrators, but the passage of the Social Security Act has made these records a matter of vital and fundamental importance both for direct administrative purposes and for public information.

These records are now being used to some extent by the state welfare departments in the administration of public welfare assistance. This use will undoubtedly continue to grow. However, the development of the federal program of old age insurance will produce a very great demand for health records. There are now over 37 million account numbers assigned by the Bureau of Old Age Insurance of the Social Security Board, and this number will steadily increase over the next few years.

We have already experienced the need for birth certificates, particularly for the determination of age. In view of the inadequate birth registrations in the past, there has been considerable administrative difficulty in determining age. From now on there is likely to be on the part of the public more insistent pressure for full registration

in order that age determinations for the future may be made properly. However, since the birth at the present time and the award of the benefit 65 years later are rather remotely connected in people's minds, this will probably not be enough to insure complete registration.

The death certificate is important for the payment of benefits now—not the monthly benefits which are paid to an individual during his lifetime, but the lump sum payments which are made at the time of death to the estate of the beneficiaries.

At present, the Bureau of Old Age Insurance is using three alternative forms: (a) the death certificate; (b) a statement by the attending physician; and (c) a statement by the undertaker. Very serious consideration was given to the proposal of requiring the use of the death certificate exclusively, but it was felt that death registrations were not sufficiently advanced at the present time to warrant it. Furthermore, the claims at present are rather small and the incentive to fraud is not very great. As time goes on, and the claims become much larger, it will become more necessary for the Social Security Board to insist upon proper certification of death. The question is, could we go to the exclusive use of the death certificate?

The desirability of such a method

* Abstract of a paper read at a Joint Session of the American Association of State Registration Executives and the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

seems to be without question. The death certificate contains a vast amount of information which would be exceedingly useful for the administration of old age insurance.

On the other hand there would undoubtedly be certain serious administrative problems involved, particularly (a) cost, and (b) the technic of using the certificate.

Necessarily the claimant must be protected from much expense in filing the claim. This is not so necessary where the claim is large but there is no way of knowing in advance how large a claim might be. Therefore, it might be necessary either for the state agency to bear this expense as a service to the federal government for old age insurance purposes, or for the Social Security Board to bear the cost as an administrative expense. There is also the possibility that such expenses might be charged back by the board against

the payments finally made when the claim is adjudicated.

The technic of using these death certificates is somewhat complicated, especially in view of the fact that corrections are sometimes made long after the original filing of the certificate. This means that statistical information obtained from the certificates must be carefully checked before being used. There are some further administrative problems in comparing the Social Security Board records with the certificates. In general, however, there are no insuperable difficulties to such an arrangement, provided there were a definite decision to make out of the death certificate for claims purposes.

It seems likely that in the longer future the Social Security Board will want to give careful attention to the possibility of requiring the death certificate exclusively as a prerequisite for the presentation of a claim.

Lung Findings in Foundry Workers

A Four Year Survey*

O. A. SANDER, M.D.

Industrial Physician, Milwaukee, Wis.

NUMEROUS foundry operations have for many years been producing chronic lung changes in those exposed to their dust, but this fact did not become generally appreciated until about 10 years ago. Many of the largest foundries were still permitting their sandblasters to work without positive pressure helmets as late as 1930, even though the hazard had been described as early as 1860.¹ Many sandstone grinding wheels were not replaced by artificial abrasive wheels until the past 5 years, even though the early literature is full of the dangers of the use of the natural stone wheel.

That the foundry industry was so tardy in realizing its dust hazard is due to a number of factors, chief of these being the great increase in concentration of the dust generated during the industrial boom from 1915 to 1925. During those years machine methods were replacing the old hand methods with the resulting excessive exposures. Most cases of silicosis developed during this speed-up era did not begin to manifest themselves until after 1925, earlier cases having been so relatively infrequent that they were not suspected as occupational in many instances.

So little was the foundry industry

concerned with these earlier isolated cases that a survey to determine the extent of the hazard was not attempted anywhere until 1931. By that time the studies in numerous other industries had become quite extensive and the statistical data from the South African Mines and the Barre Granite Quarries were being quoted generally. The fear was spreading that the foundry silicosis hazard might be equally great.

Early in 1931 the Wisconsin Manufacturers' Association requested the Metropolitan Life Insurance Co. to make a health survey of representative foundries in and around Milwaukee. Only the longest and the most dangerously exposed employees in each of 41 plants were selected for roentgen examinations. Sixty-seven of the 215 studied (31 per cent) were diagnosed as having silicosis but advanced cases were not found.² This indicated the presence of a definite hazard, but justified the conclusion that it was neither as severe nor as extensive as it had been shown to be in other industries. The report recommended the selection of workers in foundries by preemployment examinations and chest X-ray, along with periodic examinations of those dangerously exposed.

As a result of these recommendations, the survey reported here was begun in December 1932. Details of the procedure have been described in previous reports,^{3,4} the present one,

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

TABLE I
Incidence of Silicosis

<i>Roentgen Classification</i>	<i>Non-dusty Group (Modal Age 23)</i>		<i>Foundry Group (Modal Age 45)</i>		
	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>	
1. Lung markings normal	2,018	83	893	22	
2. Slight truncal exaggeration	392	16	1,885	47	} 71%
3. Marked truncal exaggeration	34	1	978	24	
4. First degree nodulation (nodules less than 2 mm.)	0	0	255	6.3	} 7% silicosis
5. Second degree nodulation (nodules 2 to 4 mm.)	0	0	22		
6. Third degree nodulation (nodules over 4 mm.)	0	0	2	0.7	
	2,444		4,035		

however, being the first attempt at a statistical analysis of the findings. Well over 15,000 individuals from numerous industries have been studied, of which close to 10,000 are foundry workers. Because of lack of time for tabulation, only slightly more than one-third of the cases studied could be made part of this report. It does include, however, practically all cases that have been seen over a 4 year interval.

The classification of X-ray appearances of the lungs used is that suggested by a special committee of authorities on this subject in 1935.⁵ While it admittedly is most difficult in borderline cases to state with definiteness that this case is silicotic and that one is not, our cases were not classified as silicotic unless the nodulation was quite definite and well distributed in both lungs. Considerable exaggeration of the linear markings with and without beading along the bronchial trunks was considered within the limits of the healthy lung picture.

INCIDENCE OF PROMINENT TRUNK SHADOWS

As a control, we have been fortunate to have had available for study a

rather large group of machine shop employees and others who had never been exposed to industrial dust. In Table I* the X-ray appearances in this non-dusty group are compared with those whose dust exposure has been entirely in foundries. While none of the 2,444 who had never been exposed to industrial dust had any nodular shadows, 392 (or 16 per cent) showed slight exaggeration of the bronchial and linear markings, and 34 (or slightly over 1 per cent) had marked exaggeration of these trunk shadows. In many cases these were believed to be secondary to a chronic nasal and sinus infection and in others no apparent cause could be found.

In the foundry group of 4,035, on the other hand, 1,885 (or 47 per cent) had slight exaggeration of the trunk shadows, and in 978 (or 24 per cent more), they were markedly exaggerated, with and without beading. Before further comparisons between the two groups are made, however, it must be noted that the non-dusty group is very much younger, slightly over 50 per cent

* It should be noted that all figures given in this report are direct tabulations and have not been biometrically corrected for all variables.

being less than 25 years of age. In the foundry group slightly more than 50 per cent are over 40 years of age. With comparable age groups, therefore, a somewhat higher percentage with linear exaggeration might be expected in the non-dusty group. This could never approach the 71 per cent of all foundry workers with exaggerated trunk markings, however, and furnishes rather conclusive evidence that at least 50 per cent of all foundry workers have a definite peritruncal fibrosis due to their previous dust exposure. In spite of this evidence, one still would hesitate to make a diagnosis of pre-silicotic fibrosis from the X-ray alone in individual cases, even when definite beading along the trunk shadows is also present.

INCIDENCE OF SILICOSIS

Our 7 per cent with definite silicotic nodulation, which includes those with infection, is somewhat lower than the 11.4 per cent reported by Pope & Zacks⁶ and higher than that recorded by Kelley and Hall.⁷ It very closely approximates the 9.1 per cent reported by Osmond.⁸ Such over-all percentages, however, mean very little because of the numerous variables, and scarcely are worth recording. For instance, one of our larger steel foundries had an incidence of 25 per

cent definite silicosis cases, whereas the average for all our steel foundries was 13 per cent, our malleable foundries 8 per cent, and that for the gray iron workers 2 per cent.

The reasons for these rather marked differences in the silicosis hazard in the various types of foundries are many, but the chief ones seem to be these: (1) Usually larger castings in steel, requiring more sand chipping by hand with pneumatic hammers; (2) larger castings more difficult to sandblast without throwing excessive dust into general atmosphere; (3) shaking out larger castings much dustier, etc.

INCIDENCE OF TUBERCULOSIS

For comparative purposes, we have divided our foundry men into two main groups: those without nodulation, the non-silicotics, and those with nodulation, the silicotics. In Table II these two groups are compared with the non-dusty group in the incidence of complicating tuberculosis. We have not classified a shadow as "healed" unless it appeared well calcified. Into the "indeterminate" classification we have thrown all shadows that seemed tuberculous which were neither well calcified nor definitely active. For "definitely active" one of the following must have been positive: (1) medium moist rales

TABLE II
Incidence of Tuberculosis

<i>Roentgen Classification</i>	<i>Non dusty Group (Modal Age 23)</i>		<i>Non-silicotic Foundrymen (Modal Age 42)</i>		<i>Silicotic Foundrymen (Modal Age 48)</i>	
	<i>No.</i>	<i>Per cent</i>	<i>No.</i>	<i>Per cent</i>	<i>No.</i>	<i>Per cent</i>
1. No infection	2,393	98	3,552	95	181	65
2. Old healed adult tuberculosis	25	1	116	3	37	13
3. Indeterminate tuberculosis	21	1	73	2	52	19
4. Active tuberculosis	3	0.1	11	0.3	8	3
5. Healed miliary calcifications	2	0.1	5	0.1	0	0
	2,444		3,756		279	

Active tuberculosis all foundrymen: 19 cases (0.47 per cent or 470 per 100,000)

after cough over lung lesion, (2) sputum positive for tubercle bacilli, (3) rapid blood sedimentation, (4) extension of infection shadows on serial films.

In making the comparisons, the differences in the average ages of the three groups must be considered. The figures for the non-dusty and non-silicotic workers approximately represent the expected incidence for their respective age groups in the general population. The non-silicotic foundry group is of special interest in suggesting an answer to a perplexing question which has received few definite answers; namely, "How much does dust exposure *per se* affect the incidence of tuberculosis in lungs as yet not silicotic?" For foundry dust exposure, at least, the tuberculosis rate seems to be no higher among the non-silicotics than in the population as a whole.

For the entire foundry group, including the silicotics, we have found a total of 19 active tuberculosis cases, or an incidence of 0.47 per cent (470 per 100,000). With an expected 300 to 350 per 100,000 incidence in our community as a whole, the foundry rate is about 50 per cent higher than that of the general population. This approximates the estimate reported by Pope and Zacks⁶ in their foundry studies.

Again, such an over-all rate means very little when one considers the extremes. For instance, one of our steel foundries with 175 employees had 6 active cases (3,400 per 100,000), while another equally large foundry showed no active cases. An old active and open chronic fibroid case which was discovered in the former plant may have been the source of infection of several of the other cases, if not all of them.

Also such case rates frequently are criticised because they represent a cross-section of only those employees who

are at work at the time of the survey and do not take into account those active cases that had become incapacitated or died before examinations were instituted. It is felt, however, that these unknown cases are in part counterbalanced by the many early active cases which are discovered by survey long before symptoms develop.

NEW INFECTION VERSUS REACTIVATION

When one considers the silicosis group alone, the tuberculosis rate seems to increase tenfold over the non-silicotic group, although this may be slightly exaggerated by the considerable increase in the average age of this group. It nevertheless is high among the foundry silicotics as with all other silicosis. Possible explanations for this constant finding have interested investigators in this field since the earliest studies. In general, the greater the silicosis hazard, the higher the tuberculosis rate. The question always arises, however, as to whether these silico-tuberculosis cases are primarily exogenous infections superimposed on simple silicosis or whether the majority are reactivations of previously acquired tuberculosis. Our serial observations of about 2,000 of the foundry men over a 4 year interval throw some light on this problem. For instance, in the open case in the foundry foreman who seems to have infected 5 fellow employees, not one of these contact cases was a silicotic and 4 were below age 30. Several cases of simple silicosis are known to have been similarly exposed, but did not become infected. This is slightly suggestive that the silicotic lung at least is no more susceptible to exogenous tuberculosis than is the young healthy lung.

Of the 4,035 foundry workers included in this report, 1,982 (49 per cent) have been observed over 4 years. In only 25 of these (or 1.3 per cent) did progressive lung changes of any

significance occur during this 4 year period. These we have listed in Table III by comparing the new infections with those in which the tuberculosis is a reactivation of a previous infection. By "new infection" is meant that the first chest film had indicated uninfected lungs without even healed infection scars, whereas a subsequent film showed shadows which proved to be developing infection. By "reactivation" is meant that at the first examination the tuberculosis was considered definitely inactive or apparently healed, whereas the later examination showed a spreading active lesion.

In comparing the two groups, the following should be noted:

New Infection (12 cases): *Reactivation* (13 cases):

- | | |
|--|--|
| 1. 4 definitely active | 1. 9 definitely active |
| 2. Only 1 of the 4 is silicotic | 2. 8 of the 9 with definite silicosis |
| 3. The 1 silicotic case only slightly active | 3. In all 8 silicotics, tuberculosis very active |
| 4. In 2 non-silicotics, tuberculosis very active | 4. Tuberculosis least active in non-silicotics |
| 5. All tuberculous lesions apical | 5. 2 cases with basal lesions |
| 6. None have died of tuberculosis | 6. 2 have died of tuberculosis |
| 7. Only 2 over 40 years of age | 7. All but 4 over 40 |

These comparisons illustrate the chief characteristics of silico-tuberculosis as it is found in the foundry worker:

1. Acquired infection before age 40 in the majority of cases.
2. Infection becomes chronic and remains so for many years, complete healing being prevented by the increasing silicotic fibrosis, but this same fibrosis preventing spread of the infection.
3. Tuberculous infection becomes so well walled-off by fibrous tissue that activity frequently cannot be detected by any known laboratory procedures. Considerable calcification may be present in such lesions surrounding living tubercle bacilli.
4. Protecting wall may be broken down and activity of infection increase later in life, often with bronchogenic spread of tubercle bacilli.
5. Very few silico-tuberculosis cases are exogenous tuberculosis superimposed on silicosis late in life.

The molder or coremaker over 50 who has only a mild or even moderate silicotic nodulation acquired by exposure to only minimal concentrations of dust over at least 30 years, runs very little risk of ever acquiring a superimposed tuberculosis. This fact is daily being more definitely proved as the period of observation of those with simple silicosis is lengthening.

PROGRESSION OF SILICOSIS

It has been repeatedly stated in most clinical reports so far published that silicosis once acquired will progress indefinitely regardless of whether or not exposure to dust is terminated. This may be true for other industries with more concentrated silica exposures, but for the 1,982 foundry men whom we have observed for 4 years, we have seen no progression of fibrosis in uninfected lungs. None of those with a pre-silicotic picture (marked truncl exaggeration) have acquired sufficient nodulation to class them now as silicotic, nor have any of those with uncomplicated silicosis visibly increased their nodulation in the 4 year interval, in spite of the fact that the majority have continued their regular foundry work.

The only exceptions to this lack of apparent progression were in the infected cases where a number with only truncl exaggeration have become nodular. This change seemed to occur about the same time that the tuberculosis was becoming active and spreading. Further, the nodulations in most cases appeared first around the tuberculous lesions and seemed to spread outward from there. This visible nodulation we believed to represent individual silicotic nodules which were becoming infected.

Because we have not found visual evidences of progressive fibrosis in uninfected lungs, does not justify the conclusion that progression is not occur-

TABLE III
New Infection (12 Cases)

Case No.	Age (1st Exam.)	Interval (Yrs.) (1st to Last Exam.)	Occupation	Years (Total)	Fibrosis	Type of Tuberculosis
2,644	31	4 (out of fdry.)	Molder	3	None	Indefinite apical shadow, not active
257	21	4	Chipper	9	"	" " " " "
662	38	4	Crane opr.	8½	Pre-nodular	Developing chronic fibroid, not active
1,436	39	4	Sand mill	10½	" "	" " " " "
816	41	3	Molder	25	" "	" " " " "
1,063	35	2	Elec. welder	19	Early silicosis	Indefinite apical shadow
867	36	3½	Sand chipper	15	" "	Developing chronic fibroid, not active
						(later died of lobar pneumonia)
14	27	4½	" "	13	" "	Developing chronic fibroid, not active
799	31	3	Sandblast (air helmet)	3½	None	" " " (?) slt. "
2,473	53	3½	Cupola tender	15	Early silicosis	" " " " "
1,443	23	2½	Sandblast (air helmet)	5	None	Early active and toxic
917	39	4	Gas cutter	17	Pre-nodular	Advanced active and rapid spread

Reactivation of Previous Tuberculosis (13 Cases)

230	50	4½	Molder	19	Early silicosis	Chronic fibroid, not toxic, slight spread
1,231	49	4	Grinder, sand	7	Pre-nodular	" " " " "
2,612	39	4	General labor	16	" "	Reactive apical scar, not toxic, slt. spread
1,945	61	4	Brass molder	46	" "	" " " " "
849	33	2	Chipper	18	Early silicosis	Minimal, slightly toxic, slight spread
508	45	4	"	11	Pre-nodular	Active, moderate extent, cavity
506	44	3	Chipper and welder	23	Early silicosis	Active, extensive, cavity
2,610	38	2	Coremaker	22	" "	Active, extensive, small cavity
2,615	37	3	Chipper and grinder	14	Pre-nodular	Active, extensive
371	55	2	Chipper	22	Early silicosis	Active, extensive, large cavity
774	48	1	Gas cutter	23	Advanced silicosis	Active, massive, large cavities (for past 3 years—living)
1,340	45	2½	Sandblast	7	} Moderate silicosis	{ Active, bronchogenic spread (died of tuberculous pneumonia)
1,347	42	2½	Gas cutter	11		
			Grinder, sand	10		
			Molder	16		{ Active, large cavity (died of tuberculous pneumonia)

ring. The dust hazard is not entirely eliminated in these foundries and may not be for years, although they are believed to be in a state of good control now. That the rate of progression will continue to be extremely slow, however, is suggested by these observations, proof of which will come with repeated examinations of this group. It is most significant, we believe, that no cases with rapid progression have been discovered. The middle aged foundry man with only mild uninfected silicosis can be assured that he will be able to work out a natural life-time in a mildly dusty atmosphere without acquiring advanced or incapacitating lung fibrosis. Moreover, as we have already stated, his chances of acquiring superimposed tuberculosis are very rare after age 40. Consequently these cases of simple

silicosis are being maintained confidently at their regular employment. Constantly improving dust control in these foundries along with elimination of possibilities of contact tuberculosis, justifies this procedure.

SILICOSIS BY OCCUPATIONS

While it is difficult to pigeon-hole many foundry occupations, general trends can be given regarding the dust hazard of each. *Sandblasting* is, of course, the greatest hazard if done without protection. Our incidence of 15 per cent silicosis is low because very few of the pre-air-helmet blasters are still at work. The few we have seen usually have advanced silicosis. Those who have always been protected with the air helmet are showing no progressive changes, several after 8 and 9 years

of such work. Those with healthy lungs are no longer being shifted to other jobs at intervals, as was the former practice.

Sand chipping and grinding of large castings is the most hazardous foundry

SILICOSIS BY LENGTH OF EXPOSURE

When the non-silicotic and the silicotic foundry men are compared according to length of their dust exposure, the results shown in Table IV are obtained:

TABLE IV

<i>Yrs. of Exposure</i>	<i>Total Number</i>	<i>Non-silicotic</i>	<i>Silicotic</i>	<i>Percentage Silicotic</i>
1 to 5	1,174	1,168	6	0.5
6 to 10	812	788	24	3.0
11 to 15	602	573	29	5.0
16 to 20	532	480	52	10.0
21 to 25	365	311	54	15.0
26 to 30	268	211	57	21.0
31 to 35	135	103	32	24.0
36 to 40	80	66	14	17.5
41 to 45	30	24	6	20.0
46 to 50	17	13	4	24.0

occupation today, our incidence being 28 per cent. Unless castings can be blasted or otherwise cleaned before the chipping operation, high concentrations (upward of 50 million) of a dust high in silica content (up to 90 per cent) may be generated.

Molding per se need not be a hazard if practised carefully and if the general atmosphere is not polluted. Our incidence of 10 per cent is slightly high because of the proximity of many molders to formerly leaky and poorly exhausted sandblast booths.

Coremaking and general core-room work should be no silicosis hazard provided the atmosphere is not polluted from the cleaning room. Our incidence was only 1 per cent.

Other occupations lie between the extremes cited regarding their silicosis potentialities. In general it may be stated that in our experience leaky sandblast and tumbling barrel equipment, sand chipping and grinding, and shake-out operations have contributed materially to the total hazard and must be eliminated first as a source of excessive pollution of the foundry atmosphere.

Significant points to be noted are:

1. Six men acquired a visible nodulation with less than 6 years of dust exposure. All 6 had been sandblasters without protection (massive exposure) at some time in the past, but with a varying interval of years since, in which they had no dust exposure. Two of these had had only 2 years of dust exposure each, one 15 years previously.

2. About half of our foundry workers had had not over 10 years of dust exposure.

3. Twenty-five years is about average length of exposure in our group to acquire demonstrable nodular silicosis.

4. In the group that had had from 40 to 50 years of dust exposure, only 22 per cent were definitely silicotic. This does not mean any peculiar resistance on the part of the 78 per cent without silicosis, but merely indicates the negligible dust hazard of many foundry jobs.

HISTORY OF UPPER RESPIRATORY INFECTION AND PNEUMONIA

It has been our practice to question every applicant for employment concerning his past medical history. Specific questions are asked with reference to (1) frequent colds, (2) bronchitis, (3) pleurisy, (4) asthma, (5) pneumonia.

A survey of our records with respect

to the answers given to these questions leads us to the conclusion that this form of inquiry is extremely unreliable and inexact. It is quite certain that the eagerness of the applicant to obtain employment will tend to make him answer all questions pertaining to past illnesses in the negative. Language difficulties also make history-taking very difficult. Nevertheless, we made an attempt in a preliminary survey to compare the incidence of upper respiratory infection and pneumonia as recorded on our history sheets in the non-dusty, non-silicotic, and silicotic groups. These gave almost identical figures for the 3 groups and suggested that the incidence of upper respiratory infection and pneumonia is the same for individuals whether they are silicotic or non-silicotic, or whether they are employed in dusty or non-dusty trades. From all previously published data this is incorrect and a statistical presentation of this material must, therefore, be postponed until a more precise effort can be made to evaluate our data.

HISTORY OF SYMPTOMS

Here, too, considerable difficulty arises in analyzing records for answers obtained concerning various symptoms referable to the chest. There is a general tendency to deny all symptoms, although occasionally one hears of shortness of breath, cough, pain in the chest, and various combinations of these. In some of the latter, no lung pathology is found and other causes for the complaints must be sought.

The literature is already replete with extravagant statements concerning the symptomatology of silicosis. For example, chest pain is mentioned in the literature as a very frequent complaint, whereas we have been surprised to note how infrequently it has been complained of even on direct questioning

of the more advanced cases. We feel, therefore, that an analysis of the symptoms presented by our foundry groups must be deferred until we are in a position to obtain more precise and correct answers and to observe for ourselves the development of symptoms by repeated serial examinations.*

GENERAL DISCUSSION

The silicosis hazard has been known to differ markedly in the several industries in which it is found, due to the numerous variations in the exposure factors. Similarly, in the foundry industry itself, marked differences in the extent of the hazard exist. The resulting varieties of lung changes range all the way from the classical silicosis of the unprotected sandblaster to the complete lack of silicotic pattern in many molders and coremakers with over 40 years of exposure.

Until the past few years, these wide differences in the silicotic reaction were believed to be due largely to the varying percentages of free silica to which workers were exposed. The foundry silicosis hazard was thought to be low because the amount of free silica dust generated was relatively low. That the non-silica components of foundry dust were of any more importance than merely as diluents was not generally considered until the recently published investigations by Emmons and Wilcox⁹ and those by Denny, Robson and Irwin.¹⁰ In these studies both groups of investigators have arrived at the very fundamentals of the cause of silicosis and their contributions are of unusual interest. For practical purposes, how-

* Comparisons of the non-dusty, non-silicotic, and silicotic groups had been contemplated for the following items: weight, blood pressure, nasal obstruction, chest expansion, heart size, vascular changes, pleurisy, bronchitis, emphysema, blood Wassermann tests. The results were so inconclusive, however, on account of the age differences that this data will not be published until more adequate age corrections can be made.

ever, the carbon and calcium components of foundry dusts are not believed to be of significant importance compared to the number of free silica particles inhaled. Certainly the foundry dust hazard will not be solved by increasing the carbon or calcium particles or by adding aluminum to the dust now generated. It can be controlled only as is being done today; namely, by controlling the dust at its source when the silica content is known to be harmful. The only reliable check of the effectiveness of such control will continue to be preemployment examinations with chest X-ray and similar periodic examinations of those exposed.

CONCLUSIONS

1. Some 4,000 foundry employees have been studied, not only for lung changes but for general physical changes as well.

2. With half of the total group having had less than 10 years of foundry exposure, about 7 per cent with definite silicosis were found.

3. Of the 279 with silicosis, 60 (or 22 per cent) had tuberculosis which either was definitely active or in which activity was indeterminate. In 8 of these (or 3 per cent of the silicotics), there was definite activity of the tuberculosis.

4. Serial observations have suggested that silico-tuberculosis as seen in foundry workers is primarily a reactivation of a previously acquired but walled-off tuberculosis.

5. Simple silicosis as seen in foundry workers is only very slowly progressive, so much so that no visible changes have appeared in 4 years of observation. Moreover, the simple silicosis among these workers is only rarely

sufficiently advanced to cause symptoms and incapacity for work.

6. These studies suggest that the tuberculosis rate, among foundry workers at least, is not raised by dust exposure *per se*, but rises only after silicosis becomes definitely established.

7. Control of the foundry hazard is believed to be best accomplished by elimination at its source of the dust generated by sandblasting, sand chipping, sand grinding, and shake-out operations. Combined with this, preemployment and periodic examinations are essential so as to prevent tuberculous individuals from carrying on a dusty trade and to discover new infection and reactivation cases as they arise.

REFERENCES

1. Rouillard. Cas de pseudo-mélanose chez un mouleur. *Bull. Acad. de Méd.*, 26:372, 1860-61.
2. McConnell, W. J., and Fehnel, J. William. Health Hazards in the Foundry Industry. *J. Indust. Hyg.*, XVI, 227-51 (July), 1934.
3. Sander, O. A. The Silicosis Problem; Some Medical and Social Phases. *Wisconsin Med. J.*, XXXV, 354-58 (May), 1936.
4. Sander, O. A. A Practical Discussion of the Silico-sis Problem. *Kansas M. J.*, XXXVIII, 57-61 (Feb.), 1937.
5. Sayers, R. R., Pancoast, H. R., Pendergrass, E. P., Lanza, A. J., McConnell, W. J., Riddell, A. R., Sampson, H. L., and Gardner, L. U. Roentgenological Appearances in Silicosis and the Underlying Pathological Lesions. *Pub. Health Rep.*, 50, 989-96 (Aug.), 1935.
6. Pope, A. S., and Zacks, David. Epidemiological Aspects of Silicosis and Tuberculosis. *Am. Rev. Tuberc.*, XXXII, 229-42 (Sept.), 1935.
7. Kelley, J. F., and Hall, R. C. Silicosis in Modern Foundries. *New York State J. Med.*, XXXVII (Mar.), 1937.
8. Omond, L. H. Dust Hazard Among Foundrymen. *Am. J. Roent.*, XXXVIII, 122-28 (July), 1937.
9. Emmons, R. C., and Wilcox, Ray. A Mineralogic Study of Silicosis. *Am. Mineralogist*, XXII, 256-67 (Apr.), 1937.
10. Denny, J. J., Robson, W. D., and Irwin, D. A. The Prevention of Silicosis by Metallic Aluminum. *Canad. M. A. J.*, XXXVII, 1-11 (July), 1937.

Development of an Industrial Hygiene Program in a State Health Department*

H. F. EASOM, M.D., AND M. F. TRICE

Director, and Engineer, Division of Industrial Hygiene, State Board of Health, Raleigh, N. C.

A SERIES of unusual developments culminated in the establishment of a Division of Industrial Hygiene as an administrative department of the North Carolina State Board of Health. For that reason its organization is not entirely typical of the developments that usually underlie the creation of a public health activity.

SUMMARY OF EVENTS

The first of the many incidents responsible for the birth of the division was the suit of an asbestos worker brought to court in 1934 to recover for damages resulting from pulmonary asbestosis alleged to have been caused by the inhalation of fine asbestos dust. This action was brought by a man named McNeely; the case has since become more or less celebrated in the annals of legislation involving occupational diseases. At that time disablement by an occupational disease was not compensable by statute although prior to this action the courts had adopted a liberal construction of the compensation laws.

The McNeely case served to emphasize the inadequacy of our laws with respect to the disabling of workers in industry, and so the following year

the Workmen's Compensation Act was amended to provide for the compensation of persons disabled by an occupational disease. The amendment stipulates that incapacitation by any one of twenty-five diseases and conditions¹ "shall be treated as the happening of an injury by accident" and thus compensable. The amendment was ratified on March 26, 1935.

For the administration of the amendment a sum of \$10,000 was appropriated. It early became apparent, as will be subsequently revealed, that this amount was insufficient to provide the services required by the new law. In their dilemma the Industrial Commission, administrator of the Compensation Laws, sought assistance and guidance from federal agencies with the result that there were enlisted the resources of the U. S. Public Health Service as well as those of the North Carolina State Board of Health. The situation appealed strongly to the State Health Officer, who saw in it an opportunity to extend the benefits of preventive medicine to approximately a million persons engaged in industrial pursuits and at the same time render a valuable service to industry.

The negotiations which followed culminated in the Industrial Commission placing the appropriation at the disposal of the State Health Officer for use in establishing a Division of Industrial

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

Hygiene as a department of the State Board of Health. At the time of this action it was anticipated that federal aid to states would become available with the passage by Congress of a Social Security finance bill. The U. S. Public Health Service promised to subsidize from such funds this new public health activity. This promise of assistance was largely responsible for the action of the Industrial Commission. Although supported in part by the Industrial Commission, The Division of Industrial Hygiene is a regularly constituted department of the State Board of Health and is under the complete control and direction of the State Health Officer.

PERSONNEL DEVELOPMENT

The Division of Industrial Hygiene became a reality in September, 1935, with the employment of a physician from the staff of the State Tuberculosis Sanatorium and a chemical engineer from the staff of the Division of Sanitary Engineering. Three months later, when office space has been allotted the new department, a secretary was added. Shortly thereafter the anticipated Social Security funds were received, and another physician and a medical technician were employed, both obtained from the State Tuberculosis Sanatorium. Thus, in less than a year the fledgling department became a 5 person division of the State Board of Health. Recently another physician and another engineer were added to the staff, so that as now constituted the division personnel numbers 7.

PROGRAM DEVELOPMENT

The burden of developing and initiating a program for the state was placed in large measure upon the shoulders of Dr. R. R. Sayers and his associates in the Public Health Service. Preliminary work indicated that siliceous dusts constitute the most extensive occupational disease hazards in the state. Accord-

ingly, a survey was made of a representative number of plants in each industry in which workers were thought to be exposed to siliceous dusts.²

The importance of a preliminary survey cannot be over-emphasized. It provides a conception of the nature and scope of a problem that can be obtained in no other way. Some data extracted from the summary of the report of the survey are presented as follows:

The report is based upon data representing 138 industrial establishments. . . .

The survey involves 5,608 persons of whom 94.5 per cent are males. . . .

Welfare activities are supported by only 20 per cent of the industries surveyed, 36 per cent of the workers, however, participate. Sick benefit provisions are available to only 5 per cent of the workers, and only 10 per cent of them participate with employers in providing group life insurance.

There are very meager, or no, first-aid supplies in 20 per cent of the plants surveyed; 10 per cent of the workers involved are thus denied the protection of elementary health safeguards.

Fifty-five per cent of all workers involved are exposed to siliceous dust hazards. In the respective mica, talc, and asbestos textile industries more than 75 per cent of the workers are exposed to siliceous dusts.

Measures for the control of dusts are provided for only one-fourth (25.7 per cent) of all workers that are exposed. This does not mean that approximately one-fourth of the workers are provided with measures that protect them; in many instances credit for dust control measures is given for devices that provide little or no protection.

In some plants the health of other workers is endangered by flagrant practices such as sand blasting in main workrooms.

In conducting the survey the health aspect of the problem was paramount at all times as is evidenced by the collection of such accessory data as that pertaining to welfare activities, sick benefit provisions, and the availability of first aid supplies.

PROGRAM INFLUENCED BY REQUIREMENTS OF WORKMEN'S COMPENSATION ACT

The program of the division from its

inception has been determined largely by the requirements of the statutes as regards the administration of the occupational disease amendment to the Workmen's Compensation Act. This legislation stipulates that the Industrial Commission shall designate by order each industry in which the workers are exposed to the hazards of asbestosis and silicosis. Furthermore, it states that the Industrial Commission shall make studies and recommendations with a view to reducing or eliminating such hazards. The work incident to performing such duties would be identical with the normal functions of an industrial health department, so that in these respects the requirements of the Industrial Commission coincide with the duties that routinely would be performed by the Division of Industrial Hygiene. However, the administration of the Act requires, in addition, that persons about to accept employment in such industries be given preemployment examinations to determine their suitability for employment involving exposure to the hazards of asbestosis and silicosis. The industrial Commission has accepted responsibility for such examinations, which are performed by the Division of Industrial Hygiene.

ACTIVITIES OF THE DIVISION

While still a fledgling department, the Division of Industrial Hygiene has undertaken an ambitious program, the extent of which has been largely due to, and even made possible by, the splendid assistance rendered by the U. S. Public Health Service.

During the first year of its existence the personnel of the division assisted U. S. Public Health Service workers in making studies of the occupational disease hazards in two major industries. During these investigations almost 1,500 workers were examined, and several hundred dust counts were

made. This work provided invaluable training in the technic employed in executing studies of this character.

In addition to this coöperative work several independent investigations have been made. A study of the occupational disease hazards associated with foundry and machine shop employment was initiated as the first major activity. This was followed by an extensive study of the mining and milling of pyrophyllite, a talc-like mineral, and steatite, which is true talc. More recently there was begun a study to evaluate the occupational disease hazards involved in the quarrying and crushing of granite, there being numerous quarries in the state.

In addition studies have been made which include newspaper establishments, brick plants, and a cotton mill. With the exception of the newspaper establishment, all investigations have involved the collection of both medical and engineering data.

TECHNIC EMPLOYED

The medical examination given a worker is rather thorough. In every instance an endeavor is made to obtain an accurate medical and occupational history. In the physical examination particular attention is given the cardio-respiratory system. A chest X-ray is made of each worker examined. Frequently, whenever there are symptoms of serious lung pathology, stereoscopic films are made. Whenever indicated, sputum, blood, and urine are subjected to laboratory analysis. A routine examination requires from 20 to 30 minutes to complete, depending upon the condition and intelligence of the worker.

In the quantification of atmospheric dust the Greenburg-Smith impinger apparatus and the refined methodology of the U. S. Public Health Service have been employed.

CONDITION OF WORKERS

The medical examinations have resulted in some interesting disclosures. Since the organization of the department a total of 4,537 workers have been examined, 1,858 (37 per cent) of whom were preemployment cases, the remainder being routine examinations of regularly employed personnel. Only 42 workers given preemployment examinations were rejected outright; 29 others were continued on a temporary basis until further examination could be made. Among the 4,537 workers examined the significant pathology discovered was limited. The more serious conditions diagnosed and the number of persons suffering from each are presented in Table I.

Summarizing, 483 or approximately 10 per cent of those examined exhibited evidence of pathology in the lungs and 3.5 per cent had high blood pressure and various types of heart disease. The most widely distributed defects, however, are those involving the oral cavity, which are not covered by the foregoing summary. There was found a high incidence of decayed teeth and diseased gums.

GENERALIZATIONS BASED ON
ENGINEERING STUDIES

Our engineering work has substantiated most of what has been published with respect to the effectiveness of the commonly employed devices and measures for the control of occupational disease hazards. Consequently, no enlargement of that phase of our program is attempted. The workroom studies have emphasized, however, that too little has been said about the value of good housekeeping. In many of the plants visited it was glaringly evident that cleaning up the workrooms and putting away equipment in an orderly manner would have contributed to a reduction in the atmos-

TABLE I

<i>Condition</i>	<i>No. Persons</i>
Silicosis	17
Silicosis (questionable)	22
Silicosis with infection	6
Asbestosis	58
Asbestosis (questionable)	11
Asbestosis with infection	6
Pneumoconiosis	39
Pneumoconiosis with infection	5
Childhood tuberculosis	175
Childhood tuberculosis and latent pulmonary tuberculosis	39
Active pulmonary tuberculosis	22
Apparently healed pulmonary tuberculosis	36
Pulmonary tuberculosis suspected	47
High blood pressure and heart disease of various types	160

pheric content of some undesirable substance. Especially is this true of the dusty industries, in most of which there was found several days' accumulation of dust under machines that generate it, deposits of dust on overhead structural members, and dust upon odds and ends placed helter-skelter about the workrooms. Such accumulations yield to the atmosphere particles of dust with every passing breeze and with every vibration of the building.

The engineering activities, especially, have demonstrated that an educational program is mandatory. Many of our employers are not aware of the existence of occupational disease hazards in industry. The subject is entirely new to them, and for that reason they must be acquainted with some of the fundamental facts that have been uncovered in recent years by industrial hygiene investigations. A part of such an informative program is to convert them to the belief that a clean and orderly plant and safe working conditions pay dividends in better morale and in increased efficiency. It is believed that once a manufacturer can be induced to enforce good house-keeping practices in his plant it will be easier then to sell him on the idea of installing effective

dust control safeguards. A program of education is likely to accomplish results where big stick methods would fail.

POLICY

The examination of large groups of people emphasizes the fact that the human race is still far from perfection. In fact, so large a percentage of the people encountered have infirmities of one kind or another that decisions relative to their fitness for employment must be based on a rational policy that is equitable alike to employee and employer. Many conditions are found which most certainly should be corrected, but which need not prevent the employment of afflicted persons. In every case of this kind the worker is advised to seek treatment from a local physician. Those found to have active pulmonary tuberculosis or extensive healed lesions are rejected or, if already employed, are removed from the industry. Those having syphilis, are so informed and reported to the county health officer. They are allowed to continue working. In any event, every effort is made to keep a person gainfully employed. A worker is never recommended for dismissal if there is any place where he may work safely. The discovery of lung pathology is not necessarily grounds for discharge. In certain cases a worker is permitted to continue in employment but is subjected to periodic examinations to determine the trend of the ailment. In the event a worker already employed is found to have defects which make a change in jobs advisable, both the employee and the employer are notified. In such cases suggestions are made relative to the type of work the employee may perform safely. The policy employed in handling certain groups of asbestos and foundry workers, which cases have become classics in the annals of compensation and industrial

hygiene experience, is certainly *not* an equitable procedure and is not the basis for action in North Carolina.

It has become evident, that it is difficult to predict just how a person will react to an occupational environment. There seems to be a certain amount of individual susceptibility or immunity.

A report on every person examined prior to employment is sent the employer with copies going to the Industrial Commission and to the Compensation Rating and Inspection Bureau. Combined engineering and medical reports are sent to these departments and to the Labor Department as well. Such practice makes duplication of work unnecessary and permits the division to be of maximum service to all agencies concerned.

COÖPERATION

The intimate association that exists between the State Board of Health and the Industrial Commission is occasioned, as has been indicated, by a conjoint administration of a state law. However, there are other state departments not bound by such ties that recognize the public health problems involved and so depend upon the State Board of Health for data with respect to occupational disease hazards, especially is this true of the Department of Labor. A most amicable and coöperative liaison exists between the State Board of Health and all other state departments that are concerned with the problems of industrial hygiene.

REFERENCES

1. Section 50½ (b), North Carolina Workmen's Compensation Act:
 "The following diseases and conditions only shall be deemed to be occupational diseases within the meaning of this Act:
1. Anthrax
2. Arsenic poisoning
3. Brass poisoning
4. Zinc poisoning
5. Manganese poisoning
6. Lead poisoning—Provided the employee shall have

been exposed to the hazard of lead poisoning for at least 30 days in the preceding 12 months' period, and; provided further only the employer in whose employment such employee was last injuriously exposed shall be liable

7. Mercury poisoning
8. Phosphorous poisoning
9. Poisoning by carbon bisulphide, methanol, naphtha, or volatile halogenated hydrocarbons
10. Chrome ulceration
11. Compressed-air illness
12. Poisoning by benzol, or by nitro and amido derivatives of benzol (dinitrol-benzol, anilin, and others)
13. Infection or inflammation of the skin or eyes or other external contact surfaces or oral or nasal cavities due to irritating oils, cutting compounds, chemical dust, liquids, fumes, gases, or vapors
14. Epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye due to tar, pitch, bitumen, mineral oil, or paraffin, or any

compound, product, or residue of any of these substances

15. Radium poisoning or injury by X-rays
16. Blisters due to use of tools or appliances in the employment
17. Bursitis, of the knee or elbow, due to intermittent pressure in the employment
18. Miner's nystagmus
19. Bone felon due to constant or intermittent pressure in employment
20. Synovitis, caused by trauma in employment
21. Tenosynovitis, caused by trauma in employment
22. Carbon monoxide poisoning
23. Poisoning by sulphuric, hydrochloric, or hydrofluoric acid
24. Asbestosis
25. Silicosis

2. Easom, H. F., and Trice, M. F. *A Report of a Survey of Certain Industries in North Carolina Involving a Siliceous Dust Hazard.* North Carolina State Board of Health, Raleigh, N. C.

Revised Fuchsin Lactose Broth for the Confirmatory Test in Water Analysis*

CASSANDRA RITTER

Bacteriologist, State Board of Health, Lawrence, Kans.

AN important factor in bacterial water analysis is the confirmatory test. It is used as a necessary step after the presumptive test, verifying the evidence of the presence of coliform organisms given by a positive presumptive reading. Especially do the large number of presumptive positives which are not caused by coliform organisms make the confirmatory test valuable in routine analysis.

For making the confirmatory test, only the solid plate media, eosin methylene blue agar and Endo agar had been recommended until 1936 when 4 liquid media were listed in the 8th edition of *Standard Methods of Water Analysis*.¹ These media, all containing dye or some other inhibitory agent, are brilliant green bile, crystal violet lactose broth, formate ricinoleate broth, and fuchsin lactose broth. Any one of them can be used for the confirmatory test instead of the solid plates. These 4 liquid confirmatory broths were recommended after a coöperative study of selective media for use in water analysis was made, and reported by Ruchhoft.^{2, 3}

The optimum concentrations of inhibitory agents and other ingredients of these media have been determined by

various workers. Levine,⁴ by counting the viable cells after 7 hours' incubation of the test medium found that bile in 0.5 per cent peptone water accelerated the growth of the colon group. Dunham and Schoenlein⁵ determined the effects of various amounts of brilliant green and of bile to be used in the brilliant green bile confirmatory medium, by similar methods. Stark and Curtis⁶ studied brilliant green bile by observing the effect of each substance on various organisms.

A thorough study of lactose fermenting bacteria not belonging to the colon group but at times interfering with their isolation, was made by Greer⁷ and others. They found *Cl. welchii*, *B. aerosporus*, and *Streptococcus fecalis* commonly present in water, and *Ps. pyocyaneus*, and several others sometimes present.

Fuchsin lactose broth⁸ was developed as a presumptive medium containing 0.015 per cent basic fuchsin added to lactose broth prepared by the Standard Methods formula. The inhibitory dye was intended to be added in such an amount that organisms causing false positive presumptive tests would not grow, and coliform organisms would. The present study was undertaken to determine how much basic fuchsin could be used in a confirmatory fuchsin lactose broth.

The inhibitory effect of varying con-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

centrations of basic fuchsin in a lactose broth medium for pure cultures of *Escherichia coli* and *Acrobacter aerogenes* was studied. The basic medium was Standard Methods lactose broth; the Difco dehydrated product was used throughout to secure uniformity. The basic fuchsin used was that having the certification number CF-15, selected as the standard for this medium. It was prepared in 0.1 per cent aqueous solution and varying amounts added to the lactose broth, which was then tubed in 10 ml. quantities. A suitable dilution of a 24 hour culture of the test organism was made in buffered dilution water, so that inoculation with a standard loop resulted in a uniformly small number of organisms. The tubes were incubated in a water bath at 37° C. for 7 hours, then removed and plated on agar. Plates were counted after 48 hours incubation at 37° C.

The results of a series of tests are presented as an average in Table I

TABLE I

Effect of the Concentration of Basic Fuchsin on the Growth of Escherichia coli in Lactose-Peptide Broth

Time Minutes	Per cent of Basic Fuchsin	Average Number of Bacteria per Milliliter	Generation Time Minutes
0		400	
420	0 (control)	76,000,000	23.9
420	0.015	48,000,000	24.9
420	0.02	38,000,000	25.4
420	0.025	5,000,000	30.8
420	0.03	900,000	37.7
420	0.035	118,000	51.1
420	0.04	10,300	80.5

In media containing 0.015 per cent basic fuchsin, the present formula, the dye is moderately inhibitory, as shown by the lengthening of the generation time from 23.9 to 24.9 minutes. Dye in the amount of 0.025 per cent is more inhibitory, the organisms grown in it having a generation time of 30.8 minutes. Larger amounts of basic fuchsin are decidedly inhibitory to this strain of *Escherichia coli*.

In Table II the results of the experiments using *Acrobacter aerogenes* as the test organism are shown.

TABLE II

Effect of the Concentration of Basic Fuchsin on the Growth of Acrobacter Aerogenes in Lactose-Peptide Broth

Time Minutes	Per cent of Basic Fuchsin	Average Number of Bacteria per Milliliter	Generation Time Minutes
0		690	
420	0 (control)	64,600,000	25.4
420	0.015	38,000,000	25.7
420	0.02	60,000,000	25.6
420	0.025	33,000,000	27.0
420	0.03	35,000,000	26.8
420	0.035	17,600,000	28.7
420	0.04	28,500,000	27.4

The inhibition caused by these amounts of basic fuchsin was much less marked than that for *Escherichia coli*; the generation time was not greatly lengthened, even with the largest amounts of dye used.

The effect of adding bile to the medium was studied similarly. Bacto-oxgall was added to lactose broth in 1 per cent and 0.5 per cent amounts, and tested without and with varying amounts of basic fuchsin. Preliminary determinations showed that the larger amounts of the dye solution used were insoluble in the bile-lactose broth medium, although the zone of inhibition had not been reached with 0.25 per cent added dye. Therefore, the use of 0.5 per cent bile was discarded. A medium containing 0.1 per cent dye and 1 per cent bile was selected for further tests.

In Table III is shown the stimulating effect of 1 per cent bile in lactose broth on the growth of *Escherichia coli* and *Acrobacter aerogenes*, and the fact that adding basic fuchsin in amounts practical to use is only slightly inhibitory.

After these preliminary experiments were made, 3 new formulae were selected for further tests. These were lactose broth containing 0.025 per cent

TABLE III

Effect of the Concentration of Basic Fuchsin and Bile on the Growth of Coliform Organisms in Lactose-Peptone Broth

Time Minutes	Per cent of Basic Fuchsin	Average Number of Bacteria per Milliliter	Generation Time Minutes
Organism: <i>Escherichia coli</i>			
0		300	
420	0 (control)	97,500,000	22.9
420	0 1% bile	190,000,000	21.7
420	0.08 "	172,000,000	21.8
420	0.1 "	160,000,000	22.1
420	0.12 "	136,000,000	22.3
Organism: <i>Aerobacter aerogenes</i>			
0		700	
420	0 (control)	68,000,000	25.3
420	0 1% bile	89,600,000	24.7
420	0.08 "	118,000,000	24.2
420	0.1 "	87,000,000	24.8
420	0.12 "	94,300,000	24.6

basic fuchsin; one containing 0.03 per cent basic fuchsin; and one with 1 per cent bile and 0.1 per cent basic fuchsin. These three media were used in parallel with Standard Methods fuchsin lactose broth containing 0.015 per cent basic fuchsin, and with brilliant green bile. Presumptive positive tubes in the following experiments were also confirmed by the Standard Methods completed test.

The reliability of the medium having a higher dye content was tested with pure cultures of lactose-utilizing organisms, both alone and in combinations. Besides *Escherichia coli* and *Aerobacter aerogenes*, organisms used were *Pseudomonas pyocyaneus*, *Bacillus aerosporus*, and a streptococcus, all freshly isolated from water; and *Clostridium welchii*, obtained from Dr. I. C. Hall. A 24 hour broth culture of these organisms was inoculated by standard loop into the 5 media and growth was observed.

Pseudomonas pyocyaneus grew in all the 5 media containing dye, producing cloudiness by 24 hours. The strain of streptococcus used did not grow in any of the 4 media containing fuchsin in 48 hours, but grew in the brilliant green bile in 24 hours. *Bacillus aero-*

sporus gave no evidence of growth in any tubes in 48 hours, but produced gas in broth containing 0.015 per cent basic fuchsin in two sets of tubes incubated for 72 hours. With *Clostridium welchii*, results were variable in the different series. In 16 sets of tubes, the 0.015 per cent fuchsin dye media was positive 5 times, although the amount of inoculum varied from 1/10 to 1/2 milliliter of broth culture, a larger amount than that used uniformly. Brilliant green bile showed gas 9 times, in the same series; none of the other media supported growth in these tests.

One ml. of a 24 hour culture of each organism excepting *Cl. welchii* was highly diluted in unsterilized tap water, so that when planted in lactose broth the 10 ml. portions would give positive results for the organism used, and 1 ml. portions would not. Combinations were obtained by mixing different amounts of the final dilution. The tap water was planted as a control, for every experiment. Positive presumptive tubes were confirmed in the 5 liquid media, and by the Standard Method. The positive confirmatory dye tubes were streaked on Endo or eosin-methylene-blue plates to observe the cultures surviving.

In every case, all the liquid confirmatory media were positive when the Standard Methods confirmation was positive. This was true for all presumptive tubes showing gas in 24 hours, but for none developing gas in 48 hours. False positive tests were shown only by the tubes containing media of 0.015 per cent dye content, in a few cases. These might have been caused by the organisms in the tap water.

The following additional observations were made:

With *Escherichia coli* and *Ps. pyocyaneus*, there was nothing distinctive in the amount of gas in the confirmatory tubes. Plates inoculated from these

tubes showed a preponderance of one organism unrelated to the proportions originally planted.

With *Escherichia coli* and *Bacillus aerosporus*, plates from positive dye tubes showed coli colonies only.

Combinations of *Escherichia coli*, *Ps. pyocyaneus* and *B. aerosporus* gave no new information. Presumptive tubes positive at 48 hours but not confirming showed *Ps. pyocyaneus* colonies on solid plates.

With *Escherichia coli* and the streptococcus, 48 hour presumptive tubes showed streptococcus alone on plate media.

DISCUSSION

Since a liquid confirmatory medium receives a fairly large inoculum of an actively growing mixed culture of water bacteria, and it is desirable to observe the presence of coliform organisms only, this observation is facilitated by the inhibition of the extraneous forms. A medium somewhat inhibitory to pure cultures of coliform organisms can theoretically be safely used for the transfer of presumptive positive cultures. This is shown to be true for the 3 new confirmatory media tested by the experiments with pure cultures of lactose-utilizing organisms, and by the

TABLE IV

Confirmations of 318 Positive Presumptive Tubes from 116 Water Samples

Media	Number of Confirmations		Number of Liquid Confirmations Positive by Standard Methods Test	
	from 24 Hour Presumptives	from 48 Hour Presumptives	from 24 Hour Presumptives	from 48 Hour Presumptives
0.015 per cent fuchsin broth	124	124	123	87
0.025 " " " "	123	91	123	85
0.03 " " " "	124	90	123	85
0.1 " " " "				
1 per cent bile broth	123	90	123	87
Brilliant green bile	123	91	123	87
Standard Methods completed test	125	86	...	..

A number of positive presumptive tubes from the routine analysis of water samples was confirmed in the same manner. The samples included waters of all degrees of pollution: raw and treated surface supplies, deep and shallow wells, springs, and swimming pools.

Table IV shows the results of tests on 116 samples.

Three hundred and eighteen positive presumptive tubes were confirmed in 5 liquid media, and by the Standard Methods completed test. Positive confirmatory tubes were also completed. False positive confirmations were shown by standard fuchsin broth in 38 cases, or 15.3 per cent.

confirmation of presumptive tubes from water samples. In 3 cases only was a negative confirmatory test shown by these media when coli-aerogenes organisms were isolated by any other confirmatory method used.

The 2 dye broths containing the greater concentrations of fuchsin, 0.025 per cent and 0.03 per cent, can be compared only by observations of the amount and time of gas production, as the positive results in the 2 were the same. With 0.03 per cent dye, a smaller amount of gas tended to be formed by 24 hours, although it was not difficult to make a reading. This concentration was used as a method

of checking the effect of the smaller amount of dye, which it did adequately.

Gas production in both media containing bile was greater than in the other tubes. Since there was no difficulty in reading any positive results, this is no particular advantage. The demonstration of fewer *Ps. pyocyaneus* organisms in the bile media is suggestive of its usefulness.

These tests show the advantages of fuchsin broth of 0.025 per cent dye content over brilliant green bile. The strain of streptococcus grew readily in the brilliant green bile; but the work of Stark and Curtis, who used 8 strains of streptococcus, demonstrated that 3 of them grew in that medium. *Cl. welchii* was inhibited only half the time in brilliant green bile and 0.015 per cent fuchsin lactose broth, but always in these experiments in the other fuchsin media.

The superiority of 0.025 per cent dye over 0.015 per cent dye, in fuchsin lactose broth, is shown by the cases from water samples, in which 0.015 per cent dye broth gave 15.3 per cent false positive results. The pure culture studies with *Cl. welchii* and *B. aerosporus* also indicated that the inhibition

from 0.015 per cent dye was not sufficient.

CONCLUSION

The basic fuchsin content of fuchsin lactose broth should be increased from 0.015 per cent to 0.025 per cent when the broth is to be used as a confirmatory medium in water analysis. Evidence is presented which would indicate that fuchsin lactose broth containing 1 per cent bile and 0.1 per cent dye is also a satisfactory confirmatory medium.

REFERENCES

1. *Standard Methods for the Examination of Water and Sewage* (8th ed.). American Public Health Association, New York, 1936.
2. Ruchhoff, C. C., and Norton, John F. Study of Selective Media for Coli-aerogenes Isolation. *J. Am. Water Works Assn.*, 27, 9:1134 (Sept.), 1935.
3. Ruchhoff, C. C. Comparative Studies of Media for the Determination of the Coli-aerogenes Group in Water Analysis. *J. Am. Water Works Assn.*, 27, 12:1732 (Dec.), 1935.
4. Levine, Max. Does Bile Inhibit or Stimulate Growth of the Colon Group? *J. Am. Water Works Assn.*, 9, 4:612 (July), 1922.
5. Dunham, H. G., and Schoenlein, H. W. Brilliant Green Bile Media. *Stain Technology*, 1:129 (Oct.), 1926.
6. Stark, C. N., and Curtis, L. R. A Critical Study of Some of the Growth-promoting and Growth-inhibiting Substances Present in Brilliant-green Bile Medium. *J. Bact.*, 32, 4:375 (Oct.), 1936.
7. Greer, Frank E., and Nyhan, Florence V. The Sanitary Significance of Lactose-fermenting Bacteria Not Belonging to the *B. coli* Group. 3. Bacterial Associations in Cultures Containing Lactose-fermenting Bacteria. *J. Infect. Dis.*, 42, 6:525 (June), 1923.
8. Ritter, Cassandra. The Presumptive Test in Water Analysis. *J. Am. Water Works Assn.*, 24, 3:413 (Mar.), 1932.

Abortion and the Public Health*

REGINE K. STIX, M.D., AND DOROTHY G. WIEHL, F.A.P.H.A.

Milbank Memorial Fund, New York, N. Y.

RECENT special studies of maternal mortality have shown that from one-fourth to one-third of all maternal deaths are associated with abortion.^{1, 2} These findings have stimulated wide interest in the problem of abortion from the point of view of the public health, and especially in the problem of the frequency with which abortion occurs. The question naturally arises whether abortions occur in a similarly large proportion of pregnancies, with a death rate approximately the same as that associated with other types of pregnancy termination, or whether these abortion deaths represent an abnormally high death rate for a small number of abortions. Obviously it is impossible to answer this question without having reliable information on which estimates of the number of abortions in the population as a whole can be based. Registration of previable terminations of pregnancy is not required in most states, and if required, as in New York City, they are very incompletely reported.

Recently several surveys have been undertaken by the Milbank Memorial Fund in which a physician or a nurse obtained complete pregnancy histories from women in their own homes. Two of the groups interviewed had been clients of birth control clinics, one in New York City³ and the other in

Cincinnati, Ohio. A third group consisted of an unselected sample of married women in New York City⁴ who had had a pregnancy which terminated within a few months of the interview. In each case the interviewer had the means of establishing a good contact with the surveyed case, either as a representative of the clinic from which the woman had sought advice or as a public health nurse interested in the problems of a recent delivery. Both the clinic groups and the survey group were selected with respect to overt fertility and the clinic groups showed an additional selection with respect to a special interest in the control of that fertility.

The outcome of pregnancies reported by the women interviewed in these three studies is compared with data from various other sources in Table I. For those groups for which information concerning the comparative prevalence of spontaneous, therapeutic and illegal abortions is available, there is a striking lack of variation in the incidence of involuntary abortion.[†] In 6 of the 7 instances in which the proportion of pregnancies terminating in involuntary abortion is known, the variation is less than 2 per cent.[‡] The consistency

[†] The term involuntary abortion includes both spontaneous and therapeutic abortions.

[‡] The low proportion of spontaneous abortions reported by patients of a New York City birth control clinic is partly dependent on the extraordinarily high proportion of illegal abortions, since illegal abortions are usually performed very early in pregnancy, before the period in which spontaneous abortion is most likely to occur (see Reference 3, p. 361).

* Read at the Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

TABLE I

*Outcome of Pregnancies from Histories of Women
in Various Areas of the United States*

Source of Data*	Year of Study	Number of Pregnancies	Per cent of Total by Type of Termination					
			Total	Live Births	Still-births	Abortions		
						Total	Spontaneous ^a	Illegal
Morbidity Reports on Periodic Canvasses								
18 States (White)—12 Months ⁵	1928-1931	910	100.0	83.6	1.7	14.7	....	....
Pregnancies Previous to One Reported on Survey or Registered								
NEW YORK CITY ⁴	1935-1936	1,525	100.0	85.4	2.6	12.1	9.2	2.9
Baltimore (Native White) ⁶	1915	14,542	100.0	89.1	2.4	8.5	....	....
Cattaraugus County, N. Y. (White) ^b	1936	605	100.0	86.7	2.6	10.7	....	....
Previous Pregnancies and Current Hospital Births								
Chicago (White Multiparae) ⁷	1931-1932	5,840	100.0	86.7	13.3**	....	....	2.1
New York City (White Multiparae) ⁷	1931-1932	7,686	100.0	85.0	15.0**	....	....	3.2
Pregnancy Histories of Patients Seeking Contraceptive Advice								
NEW YORK CITY ³	1932-1933	3,106	100.0	69.4	1.3	29.3	7.2	22.1
CINCINNATI ^b	1935-1937	7,289	100.0	81.0	2.2	16.8	8.9	8.0
Baltimore ^{8, 9}	1927-1932	6,441	100.0	84.4	....	15.6	10.1	5.6
Cleveland ¹⁰	1928-1934	16,150	100.0	82.7	17.3	....	....	....
Minneapolis ¹¹	1931-1935	8,875	100.0	82.5	1.3	16.2	10.7	5.5
Newark ¹²	1928-1930	8,314	99.9	77.4	1.2	21.3	9.7	11.6
Philadelphia ^c	1925-1936	1,221	99.9	82.8	1.2	15.9	10.7	5.2†

* The studies on which the major portion of this report is based are indicated in capital letters. Numbered references pertain to publications listed in bibliography at end of paper.

^a Includes therapeutic abortions, except as indicated.

^b Unpublished data from studies of the Milbank Memorial Fund.

^c Unpublished data from the private practice of Dr. Lovett Dewees, analyzed by Gilbert Beebe. Personal communication.

** The proportion of abortions among the current hospital births is almost certainly much lower than among pregnancies in the general population, since the hospitalized abortions will be chiefly those accompanied by a definite morbidity and therapeutic abortions. It may be estimated that the wastage among previous pregnancies of these women would be about 18 per cent for the New York women and 16 per cent for the Chicago group.

† Includes therapeutic abortions and 1.1 per cent unspecified abortion.

of these figures suggests that an average involuntary abortion rate of about 10 per cent of all pregnancies may be expected in any given population group and, therefore, with a known number of non-viable pregnancy terminations,

the incidence of illegal abortions may be estimated with considerable accuracy.

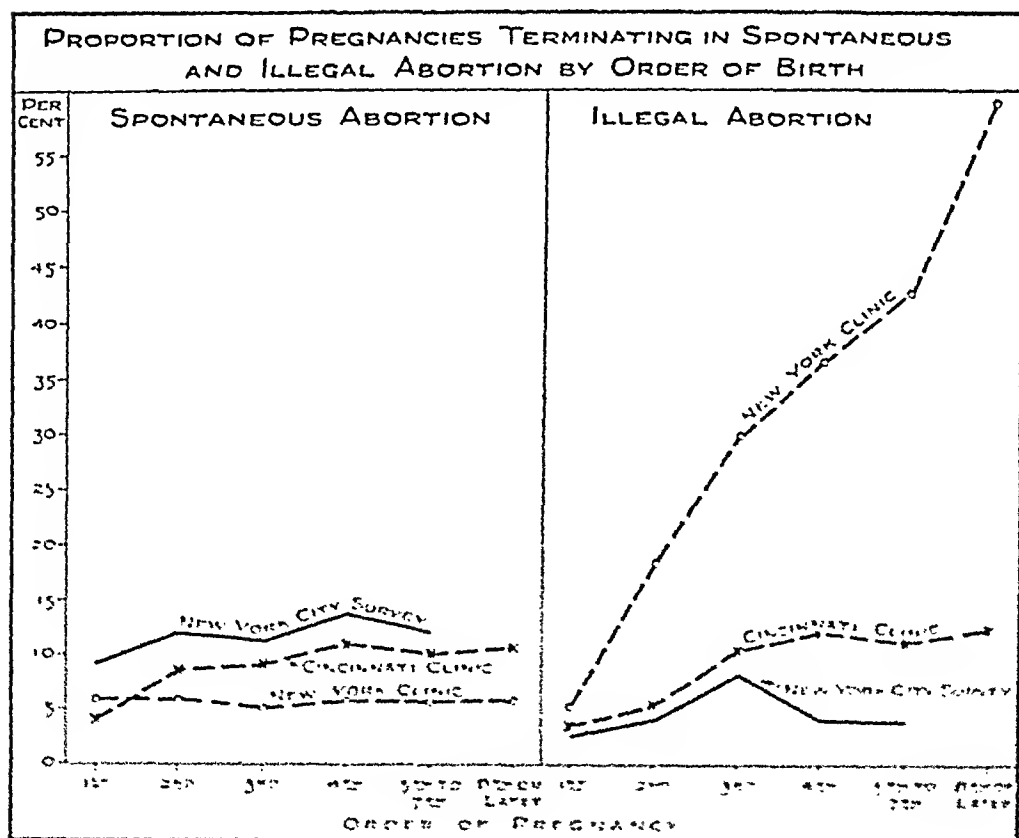
Contrasted with the similarity of figures on involuntary abortion, there is a wide variation in the reported incidence of illegal abortion in these

groups. The lowest incidence is reported by Pearl's group of multiparous patients in Chicago hospitals,⁷ and the highest by the group which attended the New York birth control clinic.³ Patients seeking advice on contraception in other cities had illegal abortion rates which were higher than those of women unselected with respect to an interest in limiting their families, but much lower than those reported by the New York clinic patients. Data for the non-clinic groups suggest that 5 per cent is a fair maximum estimate of the proportion of pregnancies terminated by illegal abortion among married white women.¹³ Higher estimates of the prevalence of illegal abortions have been based very largely on figures from the histories of women who attended the same New York birth control clinic for which data are given

in Table I.^{14, 15} This clinic group does not appear to be typical of either an average unselected group of urban married women or of clinic patients in other cities.

The per cent of pregnancies terminated by illegal abortion shows considerable variation with order of birth and income, and varies widely in these respects in the three groups studied. The variation by order of birth is contrasted with the lack of variation in spontaneous abortions by the same type of analysis in Figure I. Not only does the percentage of pregnancies terminated by illegal abortion vary widely in the three groups, but they show differing characteristics with respect to order of birth. The New York birth control clinic sample, like other samples from the same clinic, shows a marked rise in illegal abortion with increasing

FIGURE I



order of pregnancy. The Cincinnati birth control group shows a similar but much less marked rise up to the fourth pregnancy, after which the proportion of pregnancies illegally aborted tends to remain almost level. The same type of rise is observed in the New York City unselected group up to the third pregnancy. After the third pregnancy the percentage appears to drop, but the number of cases is too small to give dependable evidence on this point.

Variation of illegal abortions with family income is shown in Figure II. The variation is not so marked as that associated with increasing order of pregnancy, but the differences between the three survey groups persist. In both birth control clinic groups there is a rise in abortion rate associated with rise in income, while in the unselected New York City group, there is a rise only in one group, the poorest non-relief group. It appears from these analyses that the pressure of increasing pregnancies and certain economic and social pressures, while they appear to have no influence on the involuntary abortion rate, are important factors underlying the resort to voluntary induced abortion.

The total number of abortions occurring annually in New York City may be estimated on the basis of the ratio of abortions to live births reported in the unselected New York group.⁴ This estimate is probably quite accurate for spontaneous abortions and a minimum estimate for induced illegal abortions. The approximate number of abortions in New York City, estimated on this basis, is more than 20,000 annually, of which between 5,000 and 6,000 are illegally induced. Referring these figures to the classification of maternal deaths in the special study of deaths for 1930-1932 by the New York Academy of Medicine,¹ the indicated risk of mortality for women in the first and second trimesters of pregnancy, exclusive of ectopic pregnancy and illegal abortion, is 7 per 1,000. The rate is almost exactly the same for women experiencing illegal abortion. This rate is slightly lower than the rates reported in several series of hospital cases.^{10, 17, 18} It is almost twice as high as the rate of 4 deaths per 1,000 confinements for women delivered in the third trimester of pregnancy.

The distribution of causes of death

FIGURE II

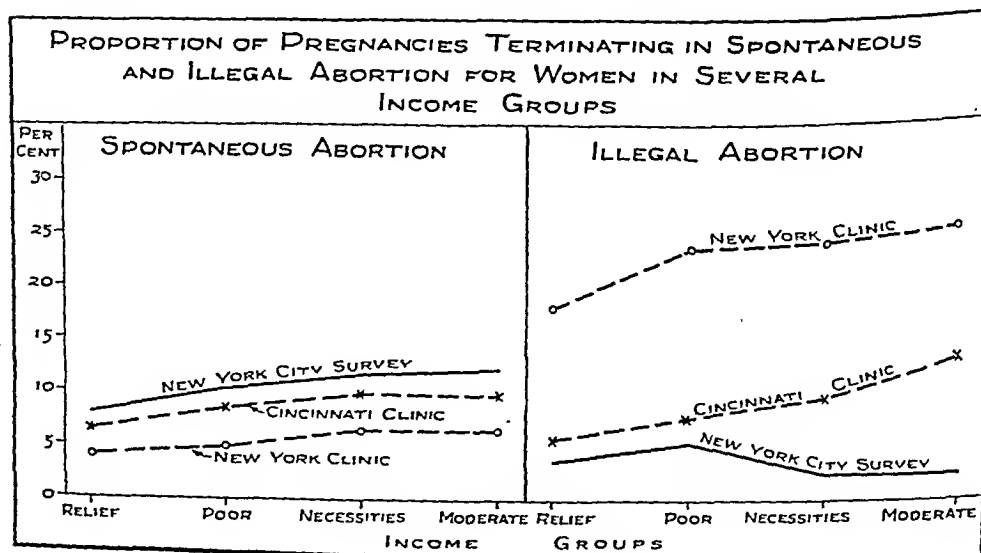


TABLE II

Abortion Morbidity Reported by Two Groups of Birth Control Clinic Patients

	<i>All Abortions</i>				<i>Spontaneous Abortions</i>			<i>Criminal Abortions</i>		
	<i>Total</i>	<i>Instrumental Interference</i>	<i>No Instru-mentation</i>	<i>Therapeutic Abortions</i>	<i>Total</i>	<i>Instrumental Interference</i>	<i>No Instru-mentation</i>	<i>Total</i>	<i>Instrumental Interference</i>	<i>No Instru-mentation</i>
	<i>Patients of Both Clinics</i>									
Number of Abortions	2,229	1,546	683	59	809	271	538	1,361	1,216	145
	<i>Per cent of Abortions for which each Type of Morbidity was Reported</i>									
Total Morbidity	15.1			66.1	17.4			11.5		
Prepartum Morbidity	5.1			49.2	7.0			2.1		
Postpartum Morbidity	10.0	11.2	7.3	16.9	10.4	17.3	6.9	9.5	9.5	9.0
Puerperal Infection	1.7	2.3	0.4	0.0	1.0	2.2	0.4	2.3	2.5	0.7
Toxemia	1.0			8.5	0.9			0.7		
Hemorrhage *	8.2			18.6	10.1			6.6		
Other *	4.2			39.0	5.4			1.9		
	<i>Birth Control Clinical Research Bureau (New York City)</i>									
Number of Abortions	1,010	885	125	34	199	100	99	777	751	26
	<i>Per cent of Abortions for which each Type of Morbidity was Reported</i>									
Total Morbidity	16.1			61.8	21.1			12.9		
Prepartum Morbidity	3.8			32.4	4.0			2.4		
Postpartum Morbidity	12.4	11.6	16.8	29.4	17.1	20.0	14.1	10.4	9.9	26.9
Puerperal Infection	2.5	2.6	4.6	0.0	1.5	2.0	1.0	2.8	2.8	3.8
Hemorrhage *	9.4			20.6	16.1			7.2		
Other *	4.3			41.2	3.5			2.8		
	<i>Cincinnati Maternal Health Clinic</i>									
Number of Abortions	1,219	661	558	25	610	171	439	584	465	119
	<i>Per cent of Abortions for which each Type of Morbidity was Reported</i>									
Total Morbidity	14.3			72.0	16.2			9.8		
Prepartum Morbidity	6.2			72.0	8.0			1.5		
Postpartum Morbidity	8.0	10.3	5.2	0.0	8.2	15.8	5.2	8.2	9.0	5.0
Puerperal Infection	1.1	1.9	0.2	0.0	0.8	2.3	0.2	1.5	1.9	0.0
Hemorrhage *	7.2			16.0	8.2			5.8		
Other *	5.9			56.0	7.2			2.4		

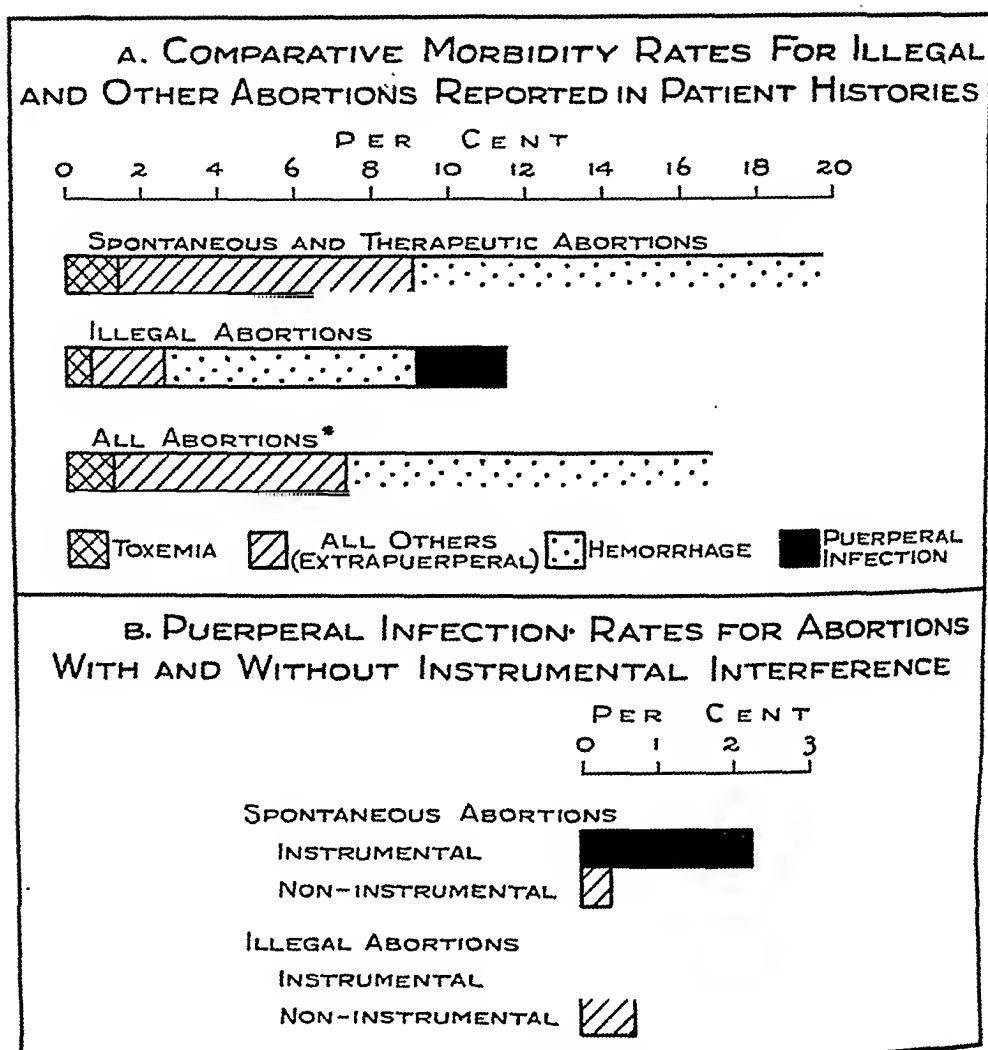
* Pre- and postpartum.

differs widely for the two types of abortion. Ninety-seven per cent of the deaths associated with illegal abortion were due to puerperal infection. Half the deaths associated with spontaneous and therapeutic abortion, however, were due to causes other than infection, the most important of which were toxemia and extrapuerperal diseases. This is readily understandable in deaths following therapeutic abortion. In deaths following spontaneous abortion, it appears that the systemic disease responsible for the maternal death was first responsible for the abortion. This is peculiarly true of influenza and pneumonia in pregnant women, and probably also true of other types of systemic disease; in other words, the

disease kills first the fetus and then the mother.

Information concerning the morbidity associated with each pregnancy termination was available in the New York and Cincinnati studies of women who had attended birth control clinics. The reported morbidity is doubtless low, and of a relatively serious nature, since it is reported by the women as history, rather than taken from a medical record of the pregnancy. It must be borne in mind, however, that it was not sufficiently serious to cause either death or sterility, since the records are those of surviving, fertile women. Thus, the type of puerperal infection reported was not just pyrexia, which in hospital series is assumed to be the diag-

FIGURE III



* The morbidity rate for all abortions is adjusted to the proportions of spontaneous, therapeutic and illegal abortions reported by the unselected group of New York women.⁴

nostic feature of a septic case, but an infection sufficiently severe to be remembered as a temporarily incapacitating illness.

Figure IIIa and Table II show separately for illegal abortions and for spontaneous abortions the rates for morbidity reported in the histories of the two groups of clinic patients. Some morbidity prepartum was reported in 7 per cent of the spontaneous abortions, but in only 2 per cent of the induced

abortions. It is clear that the women who experienced spontaneous abortions presented a greater risk at the time of the abortion than did those who experienced an illegal abortion.

A morbid condition postpartum was reported in about 10 per cent of the spontaneous abortions and in about the same per cent of illegal abortions. The type of morbidity varied, however, in that puerperal infection was associated more than twice as often with illegal

abortion (2.3 per cent) as with spontaneous abortion (1.0 per cent). Since puerperal infection was the cause of 75 per cent of all reported abortion deaths, infection is obviously the factor of the greatest concern to those especially interested in the public health aspects of the abortion problem.

Comparison of abortions in which there was some instrumental interference, usually dilatation and curettage, and those in which there was none shows that the risk of puerperal infection was about four times as high in those cases in which there was instrumental intervention as in those in which there was none (Figure IIIb). This was true both in spontaneous abortion followed by dilatation and curettage and in criminal abortion. The figures are nearly parallel for the same management in the two types of abortion. The total proportion of infected cases associated with illegal abortion was twice as high as the proportion following spontaneous abortion, however, because there was some instrumentation in more than nine-tenths of the illegal abortions, but in only about one-third of the spontaneous ones. The rate of infection for spontaneous abortions followed by curettage was the same in Cincinnati as in New York, but it is worthy of note that, while in the New York group half the cases of spontaneous abortion were followed by dilatation and curettage, this was true of only about one-fourth of the Cincinnati cases, and the incidence of infected cases in the total number of spontaneous abortions was just half as high in the Cincinnati as in the New York group. This finding confirms the observations of a number of other authors^{15, 18, 19, 20} who have concluded from studies of abortion cases in hospitals that conservative treatment of abortion presents far less risk than instrumental interference.

It has been widely assumed that

there is little or no risk of puerperal infection in non-criminal abortion. The figures from these studies point to a very definite risk when the abortion is followed by dilatation and curettage, and a slight risk when there is no operative interference. The risk of infection should be much lower in the instrumental treatment of spontaneous abortion than in the hands of the abortionist; but two factors may be present in spontaneous abortion cases which may contribute to septic morbidity and mortality: (1) Curettage following spontaneous abortion is frequently done in the home of the patient rather than in a hospital; and (2) the woman experiencing a spontaneous abortion presents a greater risk than the woman presenting herself for illegal abortion, because of the more frequent prepartum complications which are in themselves responsible for the spontaneous abortion.

From the point of view of the public health, prevention of abortion morbidity and mortality is the primary concern. What means of prevention can be devised? Spontaneous abortions may be prevented to some extent by careful management in cases in which the patient consults a physician in the early weeks of pregnancy. Taussig,¹⁵ in his text on abortion, has an excellent chapter outlining the measures which may be used both before and after conception. When abortion is inevitable, both morbidity and mortality can probably be reduced by conservative management and the avoidance of curettage whenever possible.

Theoretically all morbidity and mortality from illegal abortion is preventable and unnecessary. The phenomenon of a rapidly declining birth rate, however, is the expression of a widespread desire to limit the size of families. Population groups in the higher income brackets are enabled to limit the size of their families by the use of

reliable contraceptives. For population groups of low income, however, where economic pressure and inadequate housing are most acute, reliable contraceptive methods are not at present readily available. In these groups abortion offers a means of family limitation when inadequate contraception fails. Increased economic security and more adequate housing may decrease the acuteness of the need for family limitation in these groups. The establishment of maternal health clinics, which would make reliable contraception more readily available, would be a more immediate and direct approach to the problem.

REFERENCES

1. Hooker, Ransom S. *Maternal Mortality in New York City*. The New York Academy of Medicine. The Commonwealth Fund, New York, 1933.
2. Maternal Mortality in Fifteen States. *Children's Bureau Publ. No. 223*, 1934.
3. Stix, Regine K. A Study of Pregnancy Wastage. *Milbank Mem. Quart.*, xiii, 4:347-365 (Oct.), 1935.
4. Wiehl, Dorothy G., and Berry, Katharine. Pregnancy Wastage in New York City. *Milbank Mem. Quart.*, xv, 3:229-247 (July), 1937.
5. Collins, Selwyn D. Causes of Illness in 9,000 Families Based on Nation-Wide Periodic Canvasses, 1928-1931. *Pub. Health Rep.*, xlviii, 12:283-308 (Mar. 24), 1933. Data here presented were supplied by Mr. Collins from unpublished tabulations.
6. Rochester, Anna L. Infant Mortality. *Children's Bureau Publ. No. 119*, 1923. Figures quoted are derived from Appendix Tables 187 and 188.
7. Pearl, Raymond. Fertility and Contraception in New York and Chicago. *J.A.M.A.*, cviii, 17:1385 (Apr. 24), 1937.
8. Moses, Bessie L. *Contraception as a Therapeutic Measure*. Baltimore: Williams and Wilkins, 1936. Table III.
9. Pearl, Raymond. Statistical Report on the Fifth Year's Operations of the Bureau for Contraceptive Advice. *Fifth Report of the Bureau for Contraceptive Advice*, Baltimore, 1933, pp. 5-17.
10. Robshaw, Ruth. A Study of 4,000 Patients. Admitted for Contraceptive Advice and Treatment. *Am. J. Obst. & Gynec.*, xxxi, 3: Table I (Mar.), 1936.
11. Abramson, Milton. A Study of 2,113 Cases. Given Contraception at the Minnesota Birth Control League Clinic. *Journal-Lancet*, lvi, 8:446 (Aug.), 1936.
12. Stone, Hannah M., and Hart, Henriette. *Maternal Health and Contraception*. Part I. Social Data. New Jersey Birth Control League, Newark, New Jersey (July), 1932.
13. Wiehl, Dorothy G. A Summary of Data on Reported Incidence of Abortion. *Milbank Mem. Quart.*, xvi, 1:8:88 (Jan.), 1938.
14. Kopp, Marie. *Birth Control in Practice*. New York: McBride, 1934, Tables VIII and XII.
15. Taussig, Frederick J. *Abortion: Spontaneous and Induced*. St. Louis: Mosby, 1936. pp. 25 and 117-126.
16. Millar, William M. Human Abortion. *Human Biology*, 6, 2:271 ff. (May), 1934.
17. Reinberger, James R. Investigation and Analysis of Puerperal Deaths in Memphis. *Am. J. Obst. & Gynec.*, 32:170-174 (July), 1936.
18. Watkins, Raymond. A Five Year Study of Abortion. *Am. J. Obst. & Gynec.*, 26:161-172 (Aug.), 1933.
19. Watkins, Raymond. Abortion Deaths. *Western J. Surg. Obst. & Gynec.*, 44:318-338 (June), 1936.
20. Witherspoon, J. Thornwell. An Analysis of 200 Cases of Septic Abortion Treated Conservatively. *Am. J. Obst. & Gynec.*, 26:367-374 (Sept.), 1933.

Improved Laboratory Control of Pasteurized Milk*

WALTER VON DOHLEN TIEDEMAN, M.C.E., F.A.P.H.A.,
AND NELSON J. HOHL, M.S.

*Bureau of Milk Sanitation, State Department of Health,
Albany, N. Y.*

AMONG the laboratory tests utilized by health officials for the sanitary control of public milk supplies are the plate count, methylene blue reduction test, catalase test, acidity test, and direct microscopic count. Of these, plate counts have been most generally used beginning as early as 1893. Although these have proved to be useful in controlling quality, none of them have had a direct bearing on safety, which is the primary concern of health officials. In other words, none of the tests either revealed the presence of viable pathogenic bacteria in milk or showed whether the milk had been subjected to treatment that would surely devitalize any pathogenic organism likely to be milk-borne, that should chance to have been present prior to such treatment. Originally developed for the control of raw milk, these tests have proved to be even more indirect and uncertain indices when applied to pasteurized milk.

From its inception, the plate count has been in controversy due primarily to inconsistencies revealed by comparisons of results obtained by multiple examinations of split samples. A noteworthy attempt to overcome this, resulted in the appointment, in 1905, of a committee of the American Public Health Association, to formulate stand-

ard methods for the bacteriological examination of milk. The work of this committee has done much to standardize the technic of making agar plate counts.¹ Notwithstanding these efforts at standardization, results of agar plate counts today are anything but comparable.

Five years ago, the writers and their associates undertook a large scale comparison of standard plate counts made simultaneously by different laboratories. Ten selected large samples of milk were split into 80 portions and delivered under carefully controlled conditions to 74 laboratories throughout the state, approved by the State Commissioner of Health for making standard plate counts of milk. Several laboratories took more than one set of samples so that each technician examined a different set.

These samples were plated simultaneously at a predetermined time by 78 different technicians in these laboratories. The results² were illuminating.

Counts on samples of raw milk and pasteurized milk with normal flora were more consistent than those on abnormal milks, although on the most favorable of these, different laboratories reported counts varying from 1,000 to 30,000 and the least favorable from 1,500 to 1,000,000. The extremes on abnormal samples were no worse although the mass of results was more scattered. It is difficult for the layman to understand

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

these differences, and many have reacted by accusing the laboratory worker of bad faith.

Similarly, counts made on a sample of abnormal raw milk at the same time in the same laboratory, with conditions as nearly as possible the same but plated on samples of media submitted by 47 different laboratories, showed marked variations due particularly to erratic growth of the streptococci in mastitis milk and of thermophilic bacteria in a sample of cream. This confirmed work by Bowers and Hucker³ showing that standard media failed to support the growth of certain types of bacteria and the work of Pederson, Yale, and Eglinton⁴ showing that 37° C. is an unsatisfactory temperature of incubation, and that 32° C. is much better.

In view of this and other evidence that the technic for making standard plate counts is in need of drastic revision, there should be either a general demand on the part of health officials for such revision, or a general movement to discountenance and discontinue the use of such counts.

Using standard plate counts for what they may be worth, while making the mental reservation that they have not been worth while, health officials have been forced to depend largely upon the results of inspections to determine the safety of pasteurized milk. Inspections are necessarily infrequent, leaving intervals when almost anything might happen. It is also only natural for plant operators to do their best while an inspector is in the plant, leaving him in "the dark" as to what might happen when he is not there. There has been a great need for a test to be applied to the final product that will show whether or not it is safe.

In an effort to find something more useful than the standard plate count, we turned first to the test for coliform

organisms.⁵ The tests showed that these organisms which were almost invariably present in raw milk, seldom survived pasteurization, and that in most instances the presence of coliform organisms in 1 ml. portions of pasteurized milk by the presumptive test indicated either improper pasteurization or contamination subsequent to pasteurization. This gave us something more definite to work on than the simple estimation of the total number of bacteria present in pasteurized milk. In fact, we found that not infrequently relatively low count milk gave this evidence of improper pasteurization or contamination.⁵ In using this test we could not be sure as to the significance of coliform organisms except in the examination of a series of process samples showing the absence of such organisms in a sample of milk taken from the pasteurizer at the end of the holding period and their presence at some later stage.

Like many health officials, for some time we have hoped that a satisfactory test for pasteurization was "just around the corner." When reports published several years ago^{6,7} indicated that the amylase test for pasteurization was satisfactory, we put it to the "acid test" and found that comparable results could not be obtained on split samples.

Our experience during the past year and a half with the latest development, namely the phosphatase test, has been very encouraging. The results have indicated that the phosphatase test will differentiate properly pasteurized from improperly pasteurized milk with a high degree of precision.

The test used is that of Kay and Graham⁸ as modified by F. W. Gilcreas.⁹ Through the use of this test on samples of milk and cream we have found raw milk and cream "masquerading" under pasteurized labels, and have detected different degrees of

under-pasteurization and dilution of pasteurized milk and cream with raw milk and cream. In all of these cases showing under-treatment inspections were made at the pasteurizing plants which almost invariably revealed the cause of the trouble. These were things that the most careful inspections and repeated standard plate counts had failed to reveal. It looked as though the time consumed in making standard plate counts had been largely wasted and that routine inspections were far from satisfactory. This led us to the development of an improved laboratory control of our pasteurized milk supplies. It appeared that by frequently subjecting surprise samples of pasteurized milk and cream to examination, (a) by the phosphatase test to determine proper pasteurization, (b) by test for coliform organisms to indicate possible contamination after pasteurization, and (c) by direct microscopic count to determine care in handling, we would have a true index of the safety and sanitary quality of our public supplies. Armed with the results of such tests, the milk sanitarian can go to the pasteurizing plant, and in most instances quickly determine and eliminate the source of the trouble.

Both our mobile laboratory parties are following this procedure. Samples of the various grades of milk and cream are collected at the pasteurizing plant or from the delivery truck. It is generally possible to obtain samples that were pasteurized on the day previous to the visit, and samples pasteurized on that day. We are also experimenting with the shipment of samples by mail for examination, preparing the slide for direct microscopic examination at the time of sampling. The practical value of this improved control and the futility of control by standard plate count are demonstrated by an actual occurrence.

A health officer maintaining control

of pasteurized milk by the standard count, revoked the permit of dealer "A" to sell pasteurized milk, because of repeated standard plate counts in excess of sanitary code limits for the grade, but issued "A" a temporary permit to sell milk pasteurized at the nearby plant of dealer "B" whose record showed satisfactory standard plate counts. "A" had sent samples of his pasteurized milk to a private laboratory during the time the municipal laboratory was reporting high counts in an effort to discover the cause. The private laboratory reported standard plate counts on these samples which were within the limits prescribed by the sanitary code for that grade, and indicated that conditions were satisfactory. By chance, samples were collected from "A's" plant by our mobile laboratory party during the last days of operation before the suspension of his permit. The direct microscopic examination of these samples of milk revealed the presence of large numbers of bacteria morphologically resembling thermophiles. The phosphatase test and coliform examination indicated that the milk was satisfactorily pasteurized and not recontaminated after pasteurization.

A few days after "A's" permit had been suspended, and while "B" was pasteurizing his milk, similar samples were collected by our representatives at "B's" plant. The phosphatase test on these samples, indicated that the milk was grossly underpasteurized. An investigation revealed that a 12 hour recording thermometer chart was being used on a recording thermometer built for 24 hour charts, and that the operator was determining holding time by looking at the chart. It is obvious that when the chart showed 30 minutes holding at pasteurizing temperature, the milk had actually been held only 15 minutes. This was immediately corrected, but for some time

improperly pasteurized milk had been sold as pasteurized undetected by standard plate count or inspection.

In his effort at control by standard plate count, the health officer had unwittingly converted a safe supply of pasteurized milk into a decidedly unsafe one.

Further investigation of "A's" plant, showed that repasteurization of returned milk had been responsible for the development of thermophilic bacteria. This was easily corrected. Probably the cause for the difference in standard plate count by the municipal and private laboratories was some slight difference in media or in temperature of incubation. If both laboratories had supplemented these counts with direct microscopic examinations the cause would have been detected.

The survey in this city as a whole showed that the supply of pasteurized milk and cream was, with a few exceptions, satisfactory as determined by standard plate count. However, the phosphatase test and coliform test showed that considerable milk and cream labeled pasteurized, was being sold that was not pasteurized, or had been contaminated after pasteurization, or both.

Just a few words of caution may be in order. The phosphatase has not as yet been adopted as a standard method of milk analysis, although steps are being taken to have it tested and recognized if found satisfactory. We confidently expect that this will be done before long. Until the test is recognized, it may be advisable to use it for information and correction rather than as a basis for court action.

Also, occasionally coliform organisms may survive pasteurization. The finding of these organisms in pasteurized milk and cream cannot be taken, therefore, as positive evidence of contamination except when process samples are taken—a sample taken directly from

the pasteurizer indicates absence of these organisms, and a sample taken from some subsequent stage in the process indicates their presence.

In interpreting the results of the direct microscopic count of pasteurized milk and cream, some prominent workers have concluded that most of the bacteria that take the stain are living organisms.¹⁰ Whether living or dead, the presence of excessive numbers indicates that the milk or cream was of poor quality before pasteurization, that thermophilic bacteria have survived or thermophilic bacteria developed during pasteurization, that growth of bacteria had occurred after pasteurization, or that contamination had occurred subsequent to pasteurization, any one of which is undesirable.

The intelligent use of this improved laboratory control opens new fields for protecting public health through the economical development of safe pasteurized milk supplies of good quality.

REFERENCES

1. *Standard Methods of Milk Analysis*, 6th Ed. A.P.H.A., 1934.
2. Tiedeman, Walter von D. An Extensive Test of Variations in Bacteria Counts on Identical Milk Samples. *22nd Ann. Rep., Int. Assn. Dairy & Milk Insp.*, 1933, p. 225.
3. Bowers, C. S., and Hucker, G. J. The Composition of Media for the Bacteriological Analysis of Milk. *Tech. Bull.* 228, New York State Agr. Exper. Sta., 1935.
4. Pederson, Carl S., Yale, M. W., and Eglinton, Richard. Temperature Variations in Bacteriological Incubators. *Tech. Bull.* 213, New York State Agr. Exper. Sta., 1933.
5. Alexander, Wade F., and Milone, N. A. Some Observations on the Use of the *Escherichia-Aerobacter* Test in Pasteurization, *6th Ann. Rep., New York State Assn. Dairy & Milk Insp.*, 1932, p. 117.
6. Gould, Bernard S. The Detection of Inefficiently Pasteurized Milk Based on a Modification of the New Rothenfusser Test. *J. Dairy Sci.*, 15:230, 1932.
7. Leahy, Harold W. A Practical Test of Pasteurization, *23rd Ann. Rep. of the Int. Assn. of Dairy and Milk Insp.*, 1934, p. 93.
8. Kay, H. D., and Graham, W. R. The Phosphatase Test for Pasteurized Milk. *J. Dairy Res.*, 6:191, 1935.
9. Gilcreas, F. W., and Davis, W. S. Investigation of the Amylase and Phosphatase Tests as an Indication of Pasteurization, *10th Ann. Rep., New York State Assn. Dairy & Milk Insp.*, 1936, p. 73.
10. Ward, Archibald R., and Myers, Charles E. Influence of Dead Bacteria on Microscopic Counts of Pasteurized Milk. *A.J.P.H.*, 27:899, 1937.

Supervision of Fumigation and Extermination*

JOHN OBERWAGER, M.D., F.A.P.H.A.

*Director, Sanitary Bureau, Department of Health,
New York, N. Y.*

THE exterminator of today must have a knowledge of entomology, chemistry and sanitation. The physician and the engineer must accept the responsibility of training exterminators and fumigators for the proper performance of the health work in which they are engaged.

SUPERVISION IN NEW YORK CITY

Supervision of fumigation has become a public health problem in all large cities because of two facts: the greatly increased use in the past few years of toxic gases for the destruction of insects, vermin, and rodents; and the large number of individuals, partnerships, and corporations now engaged in the business of exterminating such pests.

In New York City 53 concerns hold permits to conduct the business of fumigation and extermination; and 240 hold permits solely for the business of extermination. In addition, 96 employees have fumigation licenses and 509 have extermination permits. From June 1, 1936, to June 1, 1937, there were 353 fumigations performed in the City of New York under the supervision of the Sanitary Bureau of the Health Department.

In order to prevent poisoning from improperly conducted exterminations and fumigation operations, Dr. Rice, Health Commissioner, forwarded to the Board of Health of the City of New York in May, 1937, recommendations to amend the Sanitary Code and regulations thereunder controlling this business. The modifications were the result of a study conducted over a period of several years. The laws on this subject in other cities in the United States and Canada were carefully studied in order to benefit by the experience of other health authorities.

The changes in the recently adopted law in this city are concerned principally with the following:

- (a) The method of reporting fumigations to the Department of Health
- (b) The insurance of the safety to occupants of premises during and following fumigation
- (c) The use in fumigation of gas masks and canisters approved by the Bureau of Mines
- (d) The use of sodium fluoride in extermination in food establishments

The Sanitary Code of the city defines a fumigant as any substance which by itself or in combination with any other substance emits or liberates gas, fumes, or vapors, and which gas, fumes, or vapors when liberated and used for the destruction and control of insects, vermin, rodents, or other pests, are

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

poisonous, noxious or dangerous to human life. An exterminator or insecticide is defined as any substance, not a fumigant, under whatever name known, used for the destruction or control of insects, vermin, rodents, or other pests.

The Sanitary Code prohibits anyone from using a fumigant, exterminator or insecticide in any building, vessel, or other place, or engaging in the business of fumigation or extermination without a permit from the Board of Health; except that a person may use an exterminator or insecticide in his own home or place of business if food to be sold is not kept on the premises.

Five types of permits are granted by the Board of Health:

1. Fumigant Permit—to conduct the business of fumigation
2. Exterminator Permit—to conduct the business of extermination
3. Employee—fumigant operator permit
4. Employee-exterminator operator permit
5. Owner-operator permit (fumigant or exterminator)

Employers or employees holding permits to do fumigating may also do exterminating, but those holding permits to do exterminating are limited to extermination. Holders of employee permits are allowed to perform fumigation or extermination only while in the employ of the holder of the appropriate permit.

Exception certificates are granted to concerns whose business requires fumigation of its own merchandise or that of others stored in a public warehouse. Such permits authorize them to do fumigation, provided that the exception certificate is first obtained and that the fumigation is performed by the holder of an employee-fumigant operator permit.

Employees who have received apprentice certificates are allowed to assist a fumigator or exterminator operator. Applications for these certificates must be filed by the employer and signed by

him and the apprentice. Apprentices are not allowed to do any fumigating or exterminating except under the direction and supervision of a licensed operator. An apprentice to a fumigator or exterminator, after 90 days of proper service, is eligible to take the employee-operator examination. If the apprentice has had 2 years of academic training, including a course in chemistry, he may take the examination after only 30 days of apprenticeship.

Applicants are examined by the Fumigant Board as to character, training, experience, and fitness. This board consists of 3 employees of the Department of Health appointed by the Commissioner. In the case of a partnership or corporation applying for a permit to conduct the business of fumigation or extermination, at least one member of the partnership or one officer of the corporation must pass the examination for the owner-operator permit. High standards are set for the written examinations, which all applicants must pass.

The Sanitary Code requires that each container of an exterminator or insecticide shall bear a label with the word "POISON" and the symbol of the skull and crossbones in red ink followed with the words "CAUTION"—This exterminator or insecticide contains (state name of poison) a deadly poison," together with the antidote therefor and the name and address of the manufacturer or packer.

The use of poisonous exterminators or insecticides in food establishments is prohibited, although fluoride which must be colored Nile blue at all times may be used where it cannot come in contact with exposed food. Sodium fluoride is a white powder and has in the past been used by mistake for flour, sugar, etc., causing poisoning and in some cases resulting in death. To prevent this, the Sanitary Code of the city prohibits the use of fluoride

unless it is colored Nile blue. Exterminators or insecticides containing living bacterial organisms are prohibited.

Concerns performing fumigation must notify the borough offices of the Sanitary Bureau and the Fire and Police Departments, in writing, 48 hours in advance, giving the location, character, and use of the place to be fumigated, the fumigant to be used and the date and time of the fumigation. They shall also warn all occupants of the place to be fumigated 12 hours in advance, stating the premises to be fumigated, the date and time, the name and address of the concern, the name of its operator, and that the premises must be vacated one-half hour before fumigation is to commence and not reentered until the fumigator posts in the entrance hall a signed and dated certificate declaring the premises safe for human occupancy.

The Code requires the operator to verify that no human beings have remained in the premises to be fumigated; to take all necessary precautions to safeguard the lives and health of persons in adjoining places; and to seal all cracks, crevices, openings and apertures in the walls, ceilings, and floors of the place to be fumigated. He shall post on all doors and entrances to the premises to be fumigated suitable warning signs as follows:

DANGER		
{ Crossbones and Skull }	FUMIGATED WITH (State name of chemical or gas)	{ Crossbones and Skull }
DEADLY POISON		
ALL PERSONS ARE WARNED TO KEEP AWAY		
Name of Fumigator		
Address		
Operator in charge		

The operator must not place the fumigating materials and apparatus in the place to be fumigated until all openings, except that for his entry and exit, have been sealed. While placing and

liberating the fumigant chemicals, he must protect and safeguard himself by suitable gloves and a mask and canister stamped with the approval of the U. S. Bureau of Mines. After he enters to use the chemicals he shall not allow any person other than a licensed fumigator or apprentice to be present until the premises are ventilated and declared safe for human occupancy. Watchmen shall be placed on guard at each entrance to keep people out.

No fumigated place shall be declared safe for human occupancy until the fumigator has

(a) Inspected without gas mask every part of the premises

(b) Kept all windows (top and bottom), doors, and other means of ventilation open for at least 6 hours

(c) Kept all drawers, closets, etc., open for at least 6 hours.

(d) Aired all mattresses, bedding, pillows, blankets, and clothing

(e) Certified as result of final inspection that the entire premises are safe for human occupancy.

Special rooms, vaults, and tanks for fumigating purposes must be approved by the Fumigant Board as to construction, location, and ventilation. These enclosures must be gastight, tested, and inspected periodically. Each door must have a suitable "Danger" sign.

No person shall use in fumigation, nor sell, offer for sale, give away or supply, for use in connection with fumigation, any gas mask and/or canister therefor, unless such gas mask and canister are of a type approved by the U. S. Bureau of Mines, and bear the stamp of approval of said bureau. No person shall refill any canister for use in connection with fumigation after said canister has been exhausted nor use a refilled canister in fumigation. Provided, that this provision in so far as it relates to approved canisters shall not apply if there are no canisters approved by the Bureau of Mines for the gas to be used.

FUMIGANTS, EXTERMINATORS AND INSECTICIDES

Hydrocyanic acid, chloropicrin ethylene oxide, carbon dioxide, methyl formate-carbon dioxide, ethylene oxide, ethylene dichloride-carbon tetrachloride, carbon disulphide, carbon tetrachloride and sulphur dioxide are some of the fumigants which are used to control and destroy insects and other pests infesting buildings and vessels. These are more or less poisonous to man as well as toxic to pests. The last one—sulphur—is cheap and was once a popular household fumigant. It is, however, much less effective than hydrocyanic acid which in the form of a gas is the most effective fumigant now known.

Sodium fluoride, naphthalene, paradichlorobenzene, borax, and pyrethrum are exterminators or insecticides generally used to eradicate and control insects commonly found in households, food establishments, and other places where a food supply is available. Of these sodium fluoride, a fine white powder, poisonous to man, is the most effective and forms the base of many commercial insect powders. Because of its poisonous nature and its resemblance to flour and powdered sugar, it may not be used in New York City unless *colored Nile blue* to avoid confusion with foods or other substances.

It might be interesting to note that physicians who devote their practice to disease due to allergy have many cases due to the allergic conditions caused by pyrethrum. There are a number of holders of exterminator permits who refuse to use pyrethrum because of its effect upon the respiratory tract.

SPECIAL FUMIGATION PROBLEMS

In connection with two new housing developments in Harlem and

Williamsburg Sections of New York City, all furniture and clothing were fumigated with HCN in a separate frame building before they were moved to the new apartments. The advice of public health authorities must be followed on this problem which is one of the important phases in housing.

For the prevention of the spread of disease by rats, the elimination of rat harborages in buildings, vessels, and other places providing food and shelter for these pests, is of prime importance. Fumigation will destroy rats which have found lodging in such places. However, the construction of buildings and vessels in such a way that such rodents cannot gain access, and the maintenance of conditions of cleanliness are the surest and most permanent methods of preventing infestation by rats. Our Sanitary inspectors are required whenever making inspections to look for rat harborages.

The possible spread of disease carrying pests by means of aeroplanes is receiving the attention of public health officials. The Pan-American Airway System now vaccinates all of its flying personnel at various points and in addition has its aeroplanes fumigated on the night prior to embarkation.

CONCLUSION

This paper outlines briefly the importance of the supervision of fumigation and extermination by public health authorities. Adequate training of those engaged in this industry and intensive supervision of this work by health officials, as practised in New York City, are vital if the public health is to be safeguarded.

It is recommended that further studies be made of the relative effectiveness of the various gases and chemicals used in fumigation and extermination.

Heart Disease in Childhood*

T. DUCKETT JONES, M.D.

Research Director, House of the Good Samaritan †; Instructor in Medicine, Harvard Medical School, Assistant in Medicine, Massachusetts General Hospital, Boston, Mass.

IN presenting to this association a few of the aspects of heart disease in childhood one becomes acutely aware of the many gaps which at present exist in our knowledge. In addition, the allotted time is insufficient to discuss many of the pertinent features of this problem in detail. It seems advisable to present a plea for the early recognition of the disease which is the common cause of heart disease in childhood, to discuss certain pertinent features of the disease, and to review briefly what results one may expect from the intelligent care of such children. Since congenital heart disease represents a relatively small percentage of children with heart disease it will not be considered in this discussion.

It is rheumatic fever and the concomitant rheumatic heart disease which is of particular interest because of its prevalence, and the frequency with which it results in a fatal outcome, or some degree of permanent heart damage. It is incorrect to speak of rheumatic heart disease as a complication of rheumatic fever, since the characteristic pathological lesions are found in the heart as well as elsewhere. Not

all rheumatic fever patients have evident heart disease, but it is likely that some degree of heart involvement generally occurs. Fully 90 per cent or more of all heart disease in childhood is of this type, and the problem is indeed a common one in the urban populations of the northern latitudes of our country. Various estimates have been established of the incidence in children of school age as being from 0.5 to 4.5 per cent, depending upon locality. These studies are helpful in determining the magnitude of the problem, but relatively few have been performed with sufficient care to be of appreciable statistical value.

With but few exceptions rheumatic fever and heart disease have never been made reportable and, indeed, the very nature of the disease offers sufficient obstacle to question the value of information obtained by routine compulsory notification. In a small, carefully followed series we have obtained such divergent reports from some physicians as to indicate that material so gathered might be misleading. Despite this lack of actual statistical information concerning rheumatic fever and rheumatic heart disease, there are few physicians, public health workers, nurses, and even school teachers in the urban populations of the northern part of the United States whose attention has not been forcibly di-

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

† Studies in rheumatic fever and chorea in this institution are made possible by a grant from The Commonwealth Fund.

rected to the seriousness of this problem. This is especially true of those who have worked in children's or general hospitals.

It is well to admit at least 3 stumbling blocks when the disease is seriously considered: (1) the etiology of rheumatic fever is unknown; (2) it is probable that the disease has never been experimentally reproduced; (3) no specific therapeutic measures are available. Some would doubtless question the validity of these statements. There has been much suggestive and valuable work, but critical interpretation and analysis of the large volume of literature forces one to these rather distressing conclusions.

It is evident that further knowledge must be forthcoming before effective public health measures may be applied. The problem, however, is one of considerable importance with regard to health of the public, and certain features are sufficiently well established to warrant discussion. Of particular note are a few of the unusual features of the life cycle of rheumatic fever. Further, it is valuable to ascertain just what results may be accomplished in the care of children with rheumatic fever and heart disease. Since any discussion of these questions involves our present knowledge of the cause of the disease, it would be wise perhaps to allude quickly to the various suggestions of a possible causative mechanism.

Since about 1900 the most numerous claims have been with regard to the streptococcus etiology of rheumatic fever. Various means have been suggested whereby some form of streptococcus is supposed to cause the disease. The suggestions may be outlined as follows: (1) The disease is the result of a generalized bacteremia with a specific streptococcus; (2) rheumatic fever is caused by the toxin of a specific streptococcus; (3) rheumatic fever is an allergic disease, the result of the

development of hypersensitivity to the products of various types of streptococci; (4) the cause of rheumatic fever is in some way related to the immunological response of the patient to infection with toxin producing and streptolysin producing strains of the hemolytic streptococcus; (5) rheumatic fever is the result of sub-clinical or chronic scurvy with a superimposed streptococcus infection.

A detailed review of the above hypotheses would be time consuming and is impossible. For a variety of reasons it is necessary to express skepticism as to the validity of these claims. Reference has already been made to the effect that rheumatic fever has not been experimentally reproduced in animals. However, one of these 5 theories deserves further discussion. Recently Coburn¹ has collected a large mass of valuable data concerning the natural history of rheumatic fever and its association with hemolytic streptococcus infection. This author believes that infection with certain strains of hemolytic streptococci followed by an immunological response, particularly as demonstrated by a rise in antistreptolysin titer, is of importance in initiating rheumatic fever. In a large, carefully controlled series of studies now in the process of evaluation and preparation for publication, we have in a large measure substantiated the work of Coburn, but consider that the association between hemolytic streptococcus infection and rheumatic fever is not necessarily one of cause and effect. Infection with the hemolytic streptococcus and the subsequent immunological response may be merely a secondary factor precipitating the clinical manifestations of the disease.

In opposition to Coburn, Wilson and her coworkers² state that neither infection with the hemolytic streptococcus nor respiratory infection in general has any distinct relation to the

onset of the manifestations of rheumatic fever. The time honored association between sore throat (either tonsillitis or pharyngitis) and rheumatic fever is known to most students of the disease. Regardless of what one considers likely with regard to the etiology of rheumatic fever, this association seems likely to hold. When the cause actually becomes established such a feature will have some place, at least in the explanation of the life cycle of the disease. Such infections have a hemolytic streptococcus factor in a high percentage of instances. In observations on some 749 rheumatic fever subjects with regard to the association between the onset of rheumatic fever and various preceding events, 58.3 per cent of 576 rheumatic fever recurrences followed sore throats or colds. In others there developed a definite hemolytic streptococcus immune response indicating a silent infection with this organism. It is also well known from our work and that of others that a recurrence of rheumatic fever follows fully 50 per cent of the sore throats in rheumatic fever subjects. Hence, this type of infection is of considerable importance with regard to the clinical manifestations of rheumatic fever and the progress of the disease in the individual patient.

Further suggestions concerning etiology have been numerous, and two of these warrant short discussion. It has long been suggested that rheumatic fever is caused by a filterable virus. In 1935, Schlesinger, Signy, and Amies³ reported the finding of small bodies by high-speed centrifugation of the pericardial and pleural exudates of rheumatic fever patients. These bodies were visible by darkfield illumination and were reported to be specifically agglutinated by serum from rheumatic fever patients. They were considered to be similar to the so-called elementary bodies proved to be of significance in

such well known virus diseases as vaccinia, psittacosis, ectromelia, and the various animal poxes. More recently, Eagles and his coworkers⁴ have corroborated and extended this work. They have found apparently similar bodies in materials collected not only from rheumatic fever and chorea patients, but also from those with rheumatoid arthritis. In corroboration of agglutination phases of the work, these observers point in addition to an indication of cross-agglutination between rheumatic fever and rheumatoid arthritis. Both of these reports are from the Lister Institute. Bodies appearing to be similar to those described have been easily obtained by high-speed centrifugation, but corroboration of the specific agglutination reactions yet remains to be demonstrated. It is disappointing that successful animal experimentation as the result of these reports has not yet been forthcoming. Such reports are of extreme interest and may prove to be of considerable importance, but further confirmation and successful animal experimentation will be necessary before it can be accepted as proved beyond question.

More recently, Wilson and Schweitzer⁵ have published an extensive statistical report on 112 rheumatic fever families concerning environment, communicability, and heredity of rheumatic fever. This work stresses strongly that there is a hereditary factor distributed among the population which makes the bearer susceptible. Data are given which the authors believe indicate that this factor is transmitted as a single autosomal recessive gene. From the data presented, environment and contagion in the acquisition of the disease could not be evaluated beyond question, nor did the authors state that heredity is the sole condition essential for the development of the disease.⁶ They do state that hereditary susceptibility would seem to determine

familial incidence of rheumatic fever. This familial incidence has been long recognized, and in fact is as high as that of tuberculosis. Such a report as that of Wilson and Schweitzer should stimulate considerable interest and widen the scope of further investigations.

It may be well to discuss briefly contagion, since a high familial incidence has often been considered to be the result of communicability. Paul and Salinger⁶ have pointed out that rheumatic fever spreads from one member of the household to another during or in association with respiratory infections. This was a carefully conceived and executed work. In our series, we have more than suggestive data in corroboration of the findings of these workers. Wilson and Schweitzer believe that if rheumatic fever is spread in families by contagion, the acquisition of the disease is primarily determined by some factor other than exposure to a rheumatic individual. This factor is suggested to be hereditary susceptibility. Rheumatic fever and heart disease have never been classified definitely as communicable diseases but the work of Paul is suggestive. Confirmation of these factors must await the demonstration of the cause of the disease.

Rheumatic fever in an acute form is generally easily recognized, as is also congestive heart failure in patients with rheumatic heart disease and rheumatic fever. In presenting a plea for the early recognition of rheumatic fever and rheumatic heart disease, several pertinent features may be briefly reviewed. Some of these features are not generally appreciated, and all are important in understanding the problem which any child with rheumatic fever or rheumatic heart disease presents.

Chronicity of rheumatic fever—an all feature has been stressed by

Swift.⁷ Save for those who have spent some years in the study of the disease, it is poorly recognized. It is rare in childhood for all evidence of rheumatic fever to subside within several weeks of the onset of the acute phase of the disease. The process is more often of months' duration, and in some, it persists for years. In many children who ultimately succumb, the disease apparently never becomes inactive. The symptoms and signs may be mild and very low-grade, but they are significant. Such symptoms may be briefly mentioned as varied degrees of joint pain, low-grade fever, subcutaneous rheumatic nodules, erythema marginata, frequent non-traumatic nosebleeds, abdominal or precordial pain, loss of weight, or even failure to gain weight, etc. Sydenham's chorea has long been considered to be associated with rheumatic fever, and the association is indeed close. There is evidence that chorea, without other manifestations of rheumatic fever, is not especially conducive to the development of rheumatic heart disease. The chronicity of chorea is well known. Congestive heart failure in the child with rheumatic heart disease should be considered evidence in itself of active rheumatic fever.

2. *Sub-clinical rheumatic fever*—

With the cessation of the clinical manifestations of rheumatic fever, the disease does not become at once inactive. There is usually laboratory evidence of the continuation of the active process. This persists for varying lengths of time, from 2 or 3 months to several years. Laboratory tests of value in this regard are an increase in the sedimentation rate of the red blood cells, repeatedly elevated leukocyte counts, and prolongation of conduction time by electrocardiogram. There is pathological evidence which supports the contention of the continuity of active

rheumatic fever in a sub-clinical form, as indicated by these tests.

The importance of such a phase of the disease is obvious. It explains the apparent silent development of or increase in the degree of rheumatic heart disease. Also it makes understandable the ease with which clinical manifestations appear. Intelligent clinical care of the patient is to some extent dependent upon the recognition of this sub-clinical phase of rheumatic fever.

3. *Recurrences or recrudescences of rheumatic fever*—Rheumatic fever is a recurring disease. It is unusual in the childhood form of the disease for the patient to have only a single illness. The severity of the individual recurrences is to a large extent the determining prognostic feature. Especially important with regard to recurrences is the first 5 or 6 years from the onset of rheumatic fever. In this time, the disease most often recurs. The majority of rheumatic fever subjects who fail to develop considerable cardiac damage, especially cardiac hypertrophy, during this time have a good prognosis.

There is no evidence available which indicates definitely whether or not recurrences are an expression of re-infection.

4. *The importance of events*—Certain events have been noted which seem to influence the onset of the clinical manifestations of rheumatic fever. These are often associated with upper respiratory infections. Usually, rheumatic fever develops within 1 to 3 weeks after such an event, there being at times a so-called silent period. One is familiar with the frequency of recurrences of rheumatic fever following such a procedure as tonsillectomy. Other operative procedures, accidents (such as broken bones), severe sunburn, extraction of teeth, and a variety of minor non-streptococcal illnesses have been observed to precipitate rheumatic fever. Bland and Jones⁸ have called attention to these, as well as to

recurrences following single doses of typhoid-paratyphoid vaccine intravenously (non-specific protein shock therapy). These events play a very definite rôle in the life-cycle of rheumatic fever, though probably secondary to other factors.

The frequency with which respiratory infections are precipitating events in rheumatic fever brings to our attention some of the disadvantages of the present attitude of school authorities. We have been impressed with the school-room as the common source of respiratory infections. It has taken long, persistent education of authorities, teachers, and even physicians to obtain coöperation in an attempt to curtail the exposure of rheumatic fever subjects to respiratory infection. The serious and varied complications of respiratory infection in public and private schools offer a distinct challenge to the medical profession.

5. *Evaluation of the presence or absence of active rheumatic fever*—This is perhaps the most important feature to be determined in the clinical care of the patient with rheumatic heart disease or previous rheumatic fever. Too long has medical attention been directed to an evaluation of the degree of rheumatic heart disease present or an interpretation of various cardiac murmurs. Clinical symptoms and laboratory tests indicative of the presence of active rheumatic fever have been minimized. It is important to recognize even sub-clinical rheumatic fever, since such patients are prone to recurrences of the disease and must be protected from various events and given rest therapy at this time. It is the active disease, rheumatic fever, which is responsible for the fatal outcome in children and young adults. Fully 80 per cent of the deaths we have observed result from rheumatic fever—Bland and Jones.⁹ Hence more attention must be focussed on the evaluation of this process.

6. *The value of rest*—Since no specific therapeutic measures exist we must turn to one of the most generally used laws of nature and physiology for our most valuable agent. There are no adequate data which prove that rest will either prevent the development of or increase in rheumatic heart disease, though there is a general impression among students of the disease that it is of material value. It is probable that rest should be continued so long as there is any evidence of active rheumatic fever. If for no other reason, rest tends to minimize the occurrence of events which often heighten the symptoms. The chronicity and the advisable long period of rest, render the treatment of the child with rheumatic fever a difficult problem.

RESULTS OF FOLLOW-UP STUDIES

Since 1921 the House of the Good Samaritan in Boston has been caring for a large number of patients with rheumatic fever, chorea, and rheumatic heart disease. Some 1,500 children and young adults have been given long hospitalization during this time. The most important single measure in the type of treatment has been rest during active rheumatic infection. An attempt has been made to educate the patient and family with regard to the features of the disease which have been stressed.

So far as possible in subsequent examinations we have attempted to determine the presence or absence of active rheumatic fever at each visit. Not all of these patients came to our attention in an early phase, but the series represents a fairly accurate picture of the disease as seen in childhood.

The follow-up studies presented are relative to the first 1,000 patients, observed for an average period of 10 years from the onset. The average age of onset was 8 years, and the average age at the time of the last observation was 18 years. Hence the data rep-

resent the first decade of rheumatic fever. Upon discharge from the House of the Good Samaritan, 672 of the 1,000 cases had evidence on physical examination of rheumatic heart disease; 328 had no evidence of rheumatic heart disease, and are classified as potential rheumatic heart disease subjects. It is interesting to note the variations which have developed in this group during the 10 year period. Of the 328 patients without evident rheumatic heart disease, 251 are still free from any evidence on examination (7 of this group have died of causes other than those associated with heart disease); 71 have developed some degree of rheumatic heart disease (5 are now dead). Reliable data are not available on 6. Of those patients developing rheumatic heart disease during the 10 years, about one-half did so as the result of recognized rheumatic fever, the remaining half having developed it silently. Of the 672 patients with rheumatic heart disease at the time of their discharge, 230 (34 per cent) are dead. The status of 188 (28 per cent) remained unchanged. In 120 instances (18 per cent) there has been definite evidence of a progression of rheumatic heart disease. In 119 (18 per cent) there has been an evident improvement in the signs of rheumatic heart disease. In 53 of these patients, the physical signs have regressed, while in 66 all evidence of heart disease on physical examination has disappeared. On 15 patients (2 per cent) we were unable to obtain adequate data with regard to the progress of their disease. The present status of the entire group is as follows: 242 are dead; 310 are potential rheumatic heart disease subjects; 427 have definite rheumatic heart disease, while on 21 data are insufficient. Of the 427 patients having rheumatic heart disease and alive, there is no limitation of physical activity in 287, while in 119 the limitation is

moderate, and in only 21 is there a serious physical handicap. It is encouraging to know that in this large group of patients, 597, nearly 60 per cent are able to carry on a normal physical life 10 years after the onset of their disease, and the number with severe limitation of physical activity is indeed small. This lends considerable encouragement to those interested in the care of rheumatic fever subjects and points definitely to the fact that it is a disease in which one may expect good results in a considerable number of instances. The distressing mortality rate of 24.2 per cent should make us double our efforts to add additional information concerning this prevalent disease.

In conclusion, it is evident that public health measures are at present sharply limited because of lack of knowledge. A plea is presented for the early recognition of rheumatic fever and rheumatic heart disease in childhood. The problem is large and difficult, but with early recognition excellent results may be obtained in a large percentage of cases. In an encouraging percentage, clinical evidence of rheumatic heart disease regresses and even disappears. The majority are able to lead an active physical life 10 years after the onset of the disease.

Education of the child and parents with regard to the features of rheumatic

fever and heart disease stressed above, is helpful in obtaining results. Each patient should receive competent medical attention by men as well trained as the group of workers in the field of tuberculosis.

Further study and careful observation of children with rheumatic fever and rheumatic heart disease are the only means whereby it will be possible to suggest and perform public health measures capable of solving this problem.

REFERENCES

1. Coburn, A. F., and Pauli, R. H. Studies on the Immune Response of the Rheumatic Subject and Its Relationship to Activity of the Rheumatic Process. *J. Clin. Invest.*, 14:755 (Nov.), 1935.
2. Wilson, M. G., Ingeman, E., Dubois, R. O., and Spock, B. McL. The Relation of Upper Respiratory Infection to Rheumatic Fever in Children. *J. Clin. Invest.*, 14:325 (May), 1935.
3. Schlesinger, B., Signy, A. G., and Amies, C. R. Aetiology of Acute Rheumatism. Experimental Evidence of a Virus as the Causal Agent. *Lancet*, 1:1145 (May 18), 1935.
4. Eagles, G. H., Evans, P. R., Fisher, A. G. F., and Keith, J. D. A Virus in the Aetiology of Rheumatic Diseases. *Lancet*, 2:421 (Aug. 21), 1937.
5. Wilson, M. G., and Schweitzer, M. D. Rheumatic Fever as a Familial Disease. Environment, Communicability and Heredity in Their Relation to the Observed Familial Incidence of the Disease. *J. Clin. Invest.*, 16:555 (July), 1937.
6. Paul, J. R., and Salinger, R. The Spread of Rheumatic Fever Through Families. *J. Clin. Invest.*, 10:33, 1931.
7. Swift, H. F. The Chronicity of Rheumatic Fever. *New England J. Med.*, 211:197 (Aug. 2), 1934.
8. Bland, E. F., and Jones, T. D. Clinical Observations on the Events Preceding the Appearance of Rheumatic Fever. *J. Clin. Invest.*, 14:633 (Sept.), 1935.
9. Bland, E. F., and Jones, T. D. Fatal Rheumatic Fever. *Arch. Int. Med.*, 61:161 (Feb.), 1935.

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

May, 1938

Number 5

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

THE CROYDON EPIDEMIC OF TYPHOID FEVER

CROYDON is a suburb of London with a population of 250,000 persons. On October 27, 1937, occurred what was regarded as the first case of an outbreak of typhoid fever in which there were some 297 primary cases and upward of 25 secondary cases, with 43 deaths. There was a local agitation and a widespread press campaign almost unprecedented in the history of epidemics. An inquiry has been going on for several months, and the report is just now available. The seriousness of the outbreak and the concern with which it was regarded officially may be estimated by the fact that Mr. H. L. Murphy, K.C., was appointed by the Minister of Health to preside, with Mr. H. J. F. Gourley and Sir Humphry Rolleston as assessors, while no less than seven lawyers representing the Croydon Division of the British Medical Association and the Medical and Panel Committee, Sanitary Inspectors, Water Officials, Borough Engineer, Medical Officer of Health, Residents' Commission, and Croydon Corporation, were allowed to cross-question and give summarizing speeches. The Medical Officer of Health was legally represented by one of the bodies which exist for the defence of medical practitioners.

It is regrettable that positive proof of the origin of the epidemic has not been given, but the conclusion is that it was caused by the pollution of a chalk well at Addington, water from which was furnished to between 36,000 and 40,000 inhabitants of the Borough. From the end of September and during October, 1937, work was being done on this well, which is 250 feet deep and 10 feet in diameter. From the beginning of the work until October 15, the water was pumped to waste, but from October 16 to November 3, it was pumped into the supply. From September 28 to October 26, a man later found to be a typhoid carrier was employed, and the pollution of the water is charged to him. Curiously enough, during the time when it was most needed, chlorination was not done, and Mr. Murphy sums up by saying, "The infection was due to an unfortunate and rare coincidence of three factors—(a) constructive changes taking place in the well; (b) one of the workmen being a typhoid carrier, and (c) the process of chlorination being in abeyance."

The general situation in regard to the water supply at Croydon strikes us as being somewhat unusual. Mr. Murphy says, "... the organization of the administration of the Borough was such as to lead to 'both misunderstanding and lack of communication between the responsible officers of the corporation in connection with the work.'" It appears from the testimony that the Borough Engineer is directly responsible for the water supply but that his duties include highways, lighting, drainage, housing, and many other matters, so that the care of the water is deputed to an assistant, and in regard to the Croydon outbreak, there apparently was a misunderstanding between the Borough Engineer and this assistant, who was directly responsible for the water works and the sanitary arrangements for the men who were working in the well. Neither the health officer nor the Borough Engineer was informed of the work going on nor of the stoppage of the chlorination. The medical officer is there to advise when wanted; the engineer to look after the water; but the medical officer is not even asked to attend the water committee meetings, does not receive copies of the agenda of the water committee, but gets the printed minutes later.

It was brought out further that there was nothing in the regulations or conditions of appointment of the Health Officer which imposed on him any particular duties or responsibilities to the water supply. Mr. Murphy states, "... the main task of the Medical Officer of Health throughout the epidemic was the provision of accommodation for the sufferers and the treatment necessary to keep down the death-roll as far as possible."

A striking feature of the evidence submitted was a set of documents, the first one December 10, 1927, and running on to November 9, 1936, showing that the Addington well was frequently subject to pollution, sometimes in the absence of *B. coli*, but sometimes with it. The collecting area of this well also seems to have been under suspicion.

One needs to ask at once what lessons this deplorable outbreak has for the water engineer and the health officer. The English are laying great stress on the value of coöperation between the health officer and the local medical practitioners which is recognized in this country also.

The one possible criticism of the Medical Officer of Health at Croydon is that there was a delay of possibly two days in strongly suspecting the water supply, probably because public water supplies are so carefully protected these days—and in this instance were believed by the Health Officer to have been protected as usual, he being in ignorance of the work and stoppage of chlorination—that he wished to exclude other possible sources before suspecting the water. Some English journals say that it may be necessary to ask the Minister of Health for a pronouncement on the subject as to where the duties of the Health Officer in relation to the water supply begin and where they end. It is held correctly that whether the actual samples are taken by members of his staff or not, his opinion as to the frequency of samples is of importance, and every laboratory report should pass through his hands.

It is plain that the health of workmen on such jobs should be looked into, and that proper arrangements be made for the disposal of urine and feces. The regular water works staff did not supply the labor, which was furnished by 18 volunteers from sewer workers. Mr. Murphy refused to accept statements that they were "carefully selected for physical fitness." A bucket was furnished for urine at the place of work and hauled up for emptying. A latrine for defecation

was dug near one of the adits, and the men instructed to use it. No much cruder system could have been devised. All this without the knowledge of the Medical Officer of Health!

Another point noted is that the credit of a health department may depend more on its quickness in the face of an epidemic than on the number and size of its institutions, or of the number of clients it caters to.

HUMAN TUBERCULOSIS OF BOVINE ORIGIN

IN the 36 years which have elapsed since the London Congress on Tuberculosis at which Koch denied the importance of bovine tuberculosis to the human race, and practically denied the transmission of the disease from cattle to man, observations have been going on in many parts of the world, and after much evidence as to the incidence of the disease in man and the types which it assumes, it is safe to say that the question has been settled as far as the fact of transmissibility goes. For years, even those who believed most in the danger of bovine tuberculosis to the human being were inclined to believe that it seldom or never caused pulmonary tuberculosis. However, from England alone there now have been reported an impressive number of such instances to which other countries have added their quota.^{1, 2}

We cite from a series of notes presented to the Permanent Committee of the "Office International d'Hygiene publique" at the October Session, 1936³: For England and Wales the incidence of human tuberculosis due to the bovine bacillus for all ages is as follows: cervical gland 50, lupus 48.1, scrofuloderma 35.6, bones and joints 19.5, genitourinary 17.4, meningitis 24.3, pulmonary 1.4. For Scotland alone the incidence is higher all along the line without regard to age, though the figures are not strictly comparable: pulmonary 4.59, meningitis 25.8, cervical 65.7, abdominal 80.7, genitourinary 27.7, bones and joints 28.7, gastric lavages (infants) 38.0, tracheobronchial glands 24.0, miscellaneous 9.3. Observations prove what has long been known, that most of the infection is due to drinking the milk of tuberculous cattle; consequently, the highest incidence of the bovine disease is in infants and children.

The Cattle Diseases Committee in England, in 1904, states that not less than 5 cows in every 1,000 were giving milk containing bovine tubercle bacilli. It was found that 13.14 per cent of farmers supplying milk to the City of Manchester were serving milk containing tubercle bacilli. A somewhat unexpected finding is that in Scotland the incidence is higher in rural than in urban areas, doubtless due to the fact that the milk of cities is better protected and that there is more pasteurization than for rural areas. In spite of these findings one will remember a short time ago an effort to improve the milk supply of Manchester failed.

Culture tests in the Low Countries yielded 13 bovine strains in 204 samples of sputum and the same worker found by gastric lavage that 188 infants gave the bovine strain 16 times. Milk samples in this same district showed infection with the tubercle bacillus in from 0.8 to 2.4 per cent, but for cattle slaughtered in the abattoirs, ranged from 34 to 35 per cent of tuberculosis. Tuberculin tests in dairy herds showed from 21 to 40.8 per cent of positive reactors. It is not surprising that all those interested in the production of pure milk and all public

health officials unite in recommending universal pasteurization for market milk. The only wonder is that it is not brought about by universal demand of the consumers.

Lange, of the German Public Health Department, has collected a mass of statistics on the prevalence of human tuberculosis of bovine origin in the various countries of the world, and given them to the Permanent Committee of the Office International d'Hygiene publique. While he has no doubt of the transmissibility of the bovine disease to the human being, he holds that if the bovine bacillus is ever eliminated from man, the diminution of tuberculosis in the countries of the world will not be much diminished and the pulmonary type, which is usually caused by the human type of the tubercle bacillus, will remain the chief source of infection against which preventive measures must be directed.

In this country we are fortunate in having a very strong sentiment among consumers as well as among health officials for the pasteurization of market milk. Unfortunately, statistics showing clearly the influence of pasteurization on the diminution of tuberculosis are not generally available. In New York City there seems to be pretty good evidence that the incidence of tuberculosis in children has fallen since the general introduction of pasteurization. It was noted above that the incidence of human tuberculosis in Scotland due to the bovine bacillus was greater in the country districts than in cities. There is a more or less widespread feeling that this is true in the United States also. We know of only one extensive study which is being made of this question and it is too early to speak positively concerning the results. However, as a whole, the country is on guard against infection from bovine sources, and our Bureau of Animal Industry has done notable work in bringing almost the entire country into the accredited area.

REFERENCES

1. Editorial—Pulmonary Tuberculosis Due to Bovine Tubercle Bacilli. *A.J.P.H.*, 26, 11:1128 (Nov.), 1936.
2. Editorial—Bovine Tuberculosis. *A.J.P.H.*, 27, 9:919 (Sept.), 1937.
3. *Bull. Office Internat. d'Hyg. Pub.*, v, 29:317-347, 1937.

SAFE MILK FOR ENGLAND?

THIS country owes so much to our British friends in the way of hygiene and public health that the situation in England at present regarding pure milk is something of a surprise, if not a shock.

England was one of the first countries to hold a Congress on Tuberculosis at which the question of transmission of the bovine type of organism to human beings was discussed, and fair proof given from America of its occurrence. In spite of this, and in spite of the many great advances which England has made in public health, the attitude in regard to pure milk is still far from what it should be, even on the part of some from whom the public seek enlightenment.

It must be said at once that officially, England is sound on this question, and the great British Medical Association¹ has been laboring for some time to educate the public as to what is meant by "safe milk," with the view of bringing so much pressure on producers and handlers by public opinion that it will be provided. The association recognized that it was not successful through the columns of the newspapers in spreading its doctrines, so decided to offer paid announcements advocating the use of pasteurized milk or that from tuberculin tested cows, which could be alone regarded as safe. Some newspapers and

weeklies accepted the advertisements but others apparently did not. Some published it but questioned the advisability of certain statements, though held that the collective opinion of such an association should not be suppressed because of possible conflict with other interests. One paper said "this unusual reluctance to print an announcement from a responsible advertiser" raised the question as to whether the journals "were influenced by the consideration that the Milk Marketing Board is financially a more important advertiser than the British Medical Association, or whether it was felt that the publication would be contrary to the public interest." Some papers were even more caustic in their comments.

The Lancet in discussing the matter raises the question as to whether or not the pronouncement by the association is scientifically justified. If it is justified, are there disadvantages in using milk which has been subjected to heat? As to the first question, it refers to a report from the Economic Advisory Council, of which Sir Gowland Hopkins was the Chairman, that bovine tuberculosis was responsible in Great Britain for certainly as many as 2,500 deaths each year, in addition to a great deal of serious illness. These figures have never been seriously challenged. The committee gave a list of 103 outbreaks of infectious diseases due to milk, affecting 12,000 people, and stated that these figures are not complete. These general statements are known to the medical profession and familiar to the reading public.

As to the ill effect of heating milk, the exhaustive survey of Sir William Savage is referred to.³ It is acknowledged that vitamin C is destroyed but is pointed out that the content of this vitamin in fresh milk is variable and often small, and that all milk in England requires some vitamin fortification. The effect on diffusible calcium is negligible. The conclusion is reached that the slight changes acknowledged as caused by pasteurization are an insufficient argument to set against the bacteriological safety of the product. The Health Committee of the League of Nations⁴ published a report from a special committee composed of representative men from several nations which gave an authoritative answer to these questions and said that the belief that any alleged injury was done by pasteurization could "be removed to the limbo of disproved and forgotten prejudices."

In the first report of the Advisory Committee on Nutrition,⁵ the opinion is expressed that a largely increased consumption of safe milk would be the greatest single measure toward improving the health of the rising generation. It is recognized that a rise in the consumption of milk which is unsafe bacteriologically would increase the risk from tuberculosis as well as other infectious diseases, a danger which might counterbalance the nutritional benefit, hence the necessity of providing safe milk and of building up public confidence in the supply.

Efforts in a number of cities to require pasteurization and to enable local authorities to prohibit the sale of milk which is not pasteurized or that does not come from tuberculin tested cows, have failed. The B.M.A.¹ believes that local authorities should have power, "after reasonable notice," to prohibit the sale of "milk which is not from tubercle-free herds or has not been submitted to approved treatment to render it bacteriologically safe." The government appears to have accepted this policy.⁶

In Canada⁷ somewhat the same struggle is in progress. In Ontario the government will introduce legislation for required pasteurization of municipal

milk supplies, with apparently a degree of certainty of success. It is backed by the Canadian Public Health Association, which has assembled facts based on the experience of more than 2,000 health officers from coast to coast.

Some of us who were in the early fight for pure milk and the pasteurization of all market milk except "Certified," find it somewhat hard to understand the attitude in such an enlightened country as England, in spite of the fact that it has acknowledged leaders in medicine, preventive medicine, bacteriology, and public health.

REFERENCES

1. *Brit. M. J.*, Feb. 5, 1938.
2. *Lancet*, Feb. 5, 1938.
3. *Lancet*, 1933, pp. 429 and 485.
4. *Quart. Bull.*, Health Organization of the League of Nations, 1937.
5. His Majesty's Stationery Office, 1937.
6. *Milk Policy*, H.M.S.O., 1937 (B.M.J.).
7. *Canad. Pub. Health J.*, Feb., 1938.

THE KING OF ENGLAND RECOGNIZES PREVENTIVE MEDICINE

NEWS comes from England that the King has appointed 6 practitioners of preventive medicine to be honorary physicians to him. The official announcement says that the recipients of this distinction will be drawn "from the members of the medical profession engaged in public health work, both in central and local government." The appointments are made for 3 years.

*The Lancet*¹ voices the gratification felt over these appointments, and points out that from now on the leaders of preventive medicine in England will have the same royal recognition as has for a long time been extended to clinical consultants and senior medical officers in His Majesty's Forces. For a long time it has been felt that the men who have built up the health administration which has been widely copied by other countries, and certainly stands at the top, have been overlooked when honors were accorded. *The Lancet* tenders its congratulations not only to those who have been honored by the King but to the public health services as a whole.

In this country we feel sure that we are safe in expressing sincere gratification over this action of the King. The great public health movement began in England, and we are indebted to that country for many of the best things which characterize our practices in this country.

REFERENCE

1. *Lancet*, Dec. 18, 1937, p. 1441.

LETTER TO THE EDITOR

TO THE EDITOR:

The following are comments on a paper by Dr. W. H. Best, Deputy Commissioner of Health, New York City, as published in the *American Journal of Public Health*, October, 1937.

At the time New York City discontinued routine examination of food handlers other than of milk, the City Council of Vancouver was urged to pass a by-law making their examination compulsory. I took the stand that the amount of money required could secure better results in disease prevention by expenditure in other more needed directions. New York's example was a helpful factor in my representation, which was acceded to by the Council.

Since the formation of the Vancouver Metropolitan Health Committee, further pressure was brought to bear on our Council and, inasmuch as our Medical Officer staff was partly available during the school holidays, this work was taken on for restaurant employees, even though we were greatly handicapped by insufficient laboratory service. The success of this work as accomplished in the City of San Diego was an item influencing this decision.

While the compilation of our results was under way, Dr. Best's excellent article came to hand.

Having in mind the need for periodical examination of as many people as possible with a view to the effort to replace cure of disease by more intense efforts toward preservation of health, and disease prevention, and realizing that education of the public and their legislative representatives is a first essential to progress in a democratic country, I feel that examination and education of food handlers has general assets along this line of value, as well

as the finding and control of carriers of disease.

To stress this angle, the following comments are made on the considerations to which Dr. Best has called attention:

1. *Dr. Best:* "The examination of food handlers by private physicians cannot be accepted as reliable."

Comment: Agreed—so that if there is any value to accrue from the examination it should be made by the health department doctors rather than by private physicians.

Dr. Best: "The health department staff, in proportion to the numbers examined, held for observation nearly 18 times as many as the private physicians, and excluded nearly 74 times as many."

Comment: One of every 28 examined was held for observation; 1 in each 452 examined was excluded, as a result of the health department examinations.

2. *Dr. Best:* "The cost is not commensurate with the public health benefits obtained."

"The only ones who might be a health menace through food handling are the typhoid carriers." . . . (Dr. Best then figures the estimated cost of examination at \$130,000 for each typhoid carrier discovered.)

Comments: The cost was less than \$.37 for each one examined. If the health department had examined them all they would, on the same basis, have found as follows:

	Held for Observation	Excluded
Tuberculosis	1,938	119
Venereal Diseases	5,121	442
Typhoid Carriers	4,352	6
Skin Diseases	221	157
Mouth and Throat Infections	(No record)	...
Total	11,632	724

The cost to the city was \$43,000 per annum. They found 2 typhoid carriers; therefore, from the city's findings the cost was \$21,500 each.

If the city had done all the work at an estimated cost of \$100,000 per annum, they

would presumably have found 6 typhoid carriers in place of 2, so that the cost would be \$16,666 for each carrier in place of \$130,000, or about one-eighth of the amount. One typhoid epidemic could cost more than that.

By later epidemiological examination, some 18 typhoid carriers were discovered who were missed by the examinations.

For a carrier to pass on typhoid through the food, he first soils his fingers at the toilet. For each typhoid carrier 20 tuberculosis cases were excluded, and for each one excluded 16 were held for observation. How many of these latter were affected with tuberculosis, but not held because not sputum positive? It has been estimated that the average case of tuberculosis passes it on to 11 more. Tuberculosis positive sputum infects the fingers by contact, and the food by fingers and by coughing, sneezing, and speaking. A daily dose thus acquired is an excellent means for passing on the disease.

Each case of tuberculosis costs the community thousands of dollars. Surely ameliorating this menace is a *public health benefit obtained*. Adding the tuberculosis and typhoid carriers together gives a cost of \$800 per case excluded.

Surely it is worth while from the public health point of view to find cases of venereal disease, even if it is rarely passed on by handling food. The estimate of 442 that might have been excluded makes 567 of the three diseases, lowering the cost to \$176 each. Again adding 157 excludable skin cases gives a total of 724, and would bring the cost per case excludable down from Dr. Best's \$130,000 for each typhoid carrier to \$176 for each excludable case.

By excluding the numerous infections spread from mouth and throat, you bring the cost down to a ridiculously low figure per case.

In addition, there is the value of finding those who otherwise would not know they had anything wrong, or knowing, were not treated by a private physician to remove potential causes of future illness and early death.

Then again, the educational value upon those concerned and the public generally is of inestimable value. Besides the menace of tuberculosis and other diseases in handling food, is their menace elsewhere.

3. & 4. *Dr. Best*: "It is essential to have routine X-ray, Wassermann, and stool examination on all."

Comment: These special examinations might, to lower the cost, be restricted to those only whose carefully taken history or clinical examination suggested the slightest

possibility of infection or contact. Otherwise, if the budget is available it would pay to do first a tuberculin test and X-ray only on the positives, and to confine stool examinations to those who give positive agglutination blood tests only.

5. *Dr. Best*: "Certificates of Health."

Comment: If the cost for school children examinations is all right, why not for food handlers? It is good for the day and, apart from fresh infection, also for the year. The certificate, however, should be given as satisfactory on the day of issue only. Thorough periodical examinations theoretically could prevent 85 per cent of all illness; practically, they have removed up to 68 per cent of all defects in certain trials.

6. *Dr. Best*: "Many communicable diseases are not spread by food."

Comments: Many of the communicable diseases are passed on by exhalations from the mouth and nose, direct to those exposed and also indirect by fomites, of which food is one.

The presence in a community of any communicable disease is an added opportunity of finding carriers. This alone is of value even if spread through the handling of food is limited. Figures are available to show that during a recent influenza epidemic, investigation of the employees in an industry showed that its prevalence among those who ate at restaurants exceeded many times that of those who remained at the plant.

Reporting—Not all cases are reported.

Typhoid Carriers—How can a carrier be reported without finding him?

(a) How about the unseen and unreported cases?

(b) How many carriers arrive from outside the locality?

(c) Those who have been life-long carriers from a case in early life?

(d) From an unrecognized or unrecognized case?

(e) From a person infected but not contracting the disease?

In this section, it is stated that of the 35 carriers found as the result of food handlers' examinations, 23 were found during the period of compulsory examination.

As the result of epidemiological investigation, 28 were found, of whom 18 were discovered during the same period, making a total of 41 carriers who were missed apparently by the private physician examinations—or was their own compulsory examination incomplete?

Relative to typhoid cases cited from 1933 to 1936 with a decrease of 38.6 per cent,

it is fair to note that as it was not till September, 1934, that the examinations were discontinued, the decrease in cases thereafter was only 8.1 per cent, which is coincident with the general country-wide decrease in the last few years. If examinations had been continued and more overlooked carriers found, the decrease would obviously have been still greater. Of course we acknowledge that as the incidence of typhoid fever decreases, the number of carriers goes down too, automatically.

All that is said regarding instruction of food handlers holds good, and this effort should be greatly extended.

Careful consideration given to the facts brought out above certainly seems to warrant asking for reconsideration of the advice that the examination of food handlers is not worth while.

J. W. McINTOSH, B.A., M.B., D.P.H.
Senior Medical Health Officer
Metropolitan Health Committee
Vancouver, British Columbia

April 11th, 1938.

PUBLIC HEALTH EDUCATION*

A Great Year for Health Education—Never has there been such progress in health education in a short period as in 1937-1938.

Ancient taboos as to venereal diseases have been crushed . . . Picture magazines have presented challenging health messages to millions . . . Motion pictures have pictured positive health to greater audiences than ever in the past . . . And maternal care and child birth are becoming decent and respectable.

It all started with a nonspectacular magazine article by the Surgeon General in the *Survey Graphic*. Happily timed, republished in *Reader's Digest*, the article was dynamite for blowing out the key log in a piled up jam of ignorance and neglect. That Dr. Parran was new on the job was in itself a "break." This gave news value to his personality, his background, and his position in the health world. The combination emphasized what he had written. Quickly the opportunity was recognized by many who could make the most of it.

Then came the picture magazines with their millions of new picture-readers. And health benefitted from both technics and circulations far beyond any dreamable health budgets. The picture magazines too have been sound and decent in health presentations. *Look* has had Dr. Morris Fishbein as medical editor, and *Life* has been meticulous in its respect for medical and health standards.

Then came the movies—the March of Time on the screen. This meant exceptional documentary presentations upon more screens than had ever before carried health messages.

We can now look forward to the possibility of nation-wide education as to maternity care. The motion picture, "The Birth of a Baby," is being offered under professional auspices never before granted to a health picture. The 4 page reproduction by *Life* of stills from the picture reached, in one week or so, two million circulation introducing the film throughout the country. The attempts at censorship of both movie and magazine have forced birth and maternal care into public discussion.

Yes, it has been a wonder year for health education.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Nevertheless what happened this year was possible because of what had been done during the preceding years. None of the above listed achievements could have been possible without the foundation work by physicians, health workers, and lay people—hundreds and thousands of them. All honor is due several generations of them.

"Danger Ahead": Steep Hills and Sharp Curves—The spectacular nature of the recent record emphasizes the dangers ahead.

Charlatans already are chiseling on the public interest.

Many would-be friends may need to be curbed.

Those who talk and write for health agencies need to be as wise and careful as ever before.

Public tolerance is not to be overstrained. Public interest is not to be trifled with.

Health educators may well give their best thinking to the opportunity—and the responsibility—which 1937–1938 has brought to them.

"When Ladies Meet"—Under this title is presented "the etiquette of introducing them to the agenda" in an article in *Womans Press*, the Y.W.C.A. official journal, 600 Lexington Ave., New York, N. Y. March, 1938. 20 cents.

Did you ever sit through a meeting in which it was perfectly obvious that not a member present (including the chairman) had had in advance the slightest notion of what matters were to come up for consideration? Minutes ticked by the tens and twenties and thirties while the background, causes, facts and problems were presented. And then the group were expected to discuss, to weigh wisely and to vote without further deliberation. Sometimes after a member got to thinking over the question at home in more leisurely fashion, a fresh idea or possibility occurred to her and she wished that she had voted differently or at least that she had thought of it in time to inject a new angle into the discussion.

Follows a description of how the Oklahoma City Y.W.C.A. sends to board and committee members a variety of mimeographed information sheets covering the business to come before the next meeting. This material is well mimeographed on colored paper, with diagrams and even cartoons when timely.

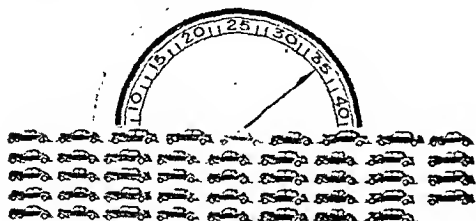
Even though all members of the group may not read all of the advance material one may be sure that some will, and these informed persons will leaven the whole group with their understanding of the business at hand.

The editor would welcome reports of how health agencies prepare for committee and other administrative and conference sessions.

To Reward or Not To Reward—We have given testimonies against contests and prizes. Here is the other side of the case as stated in *New York State Educator* (April, 1937):

Progressive Education looks with pronounced disfavor upon prizes. Most of us in public school work, however, have inherited situations which compel continuance of certain established prizes whether we like it or not. And anyway I wonder sometimes if P.E. may not be off on the wrong foot in this regard. We try to make school more a real world and less an artificial world, and what do we find in the real world? Great interest, certainly, in the Nobel prize, the Pulitzer prizes, the Newberry prize, the Bok awards, and many others designed to reward good work and stimulate more of it. We applaud the National Speech Arts Fellowship for handing a gold medal to Helen Hayes, some other organization for similarly honoring Ina Claire, and still another for giving the best radio announcer of the year a bit of coveted laurel. The state itself dangles "scholarships" before the eyes of best students in each Assembly District and the whole Civil Service System is essentially a system of conducting competitions with jobs as prizes. Much of normal existence is a valiant struggle for some sort of prize, sometimes winning, many times losing. To know how to win, without arrogance and to lose without discouragement, this is something no school need be ashamed to teach.

IF an accident occurs while your car is traveling under 40 MILES AN HOUR there is only ONE CHANCE IN 44 that someone will be killed....



But—



IF an accident occurs while your car is traveling over 40 MILES AN HOUR there is ONE CHANCE IN 19 that someone will be killed... DEATH Begins at 40!

A sample page without color from
"Death Begins at 40!"

How It Is Said—For quite a period "Dr. Jones" has been saying things in *Health News*, New York State Dept. of Health. Here is a Feb. 14, 1938, sample:

"Speaking of health information service, I was on a train, here a while ago, going to a meeting and I struck up an acquaintance with a fellow that said he was in the advertising business. I happened to have a copy with me of this 'Drink More Milk' ad we've been running here in the local paper, so I showed it to him. It told how milk is the best food there is, cheap at any reasonable price—and about experiments where a lot of school kids that had extra milk every day—how they gained more weight and height than the others and had better scholarship—and so on. I thought it was pretty good, myself.

"Well, I saw right away he didn't think much of it. He was diplomatic about it: he just read it and handed it back to me. All he said was 'Uh huh.' So I asked him what was wrong about it. 'Well,' he says, 'let me show you.' So he got out a pad and fixed up one himself. It had a sketch

of a stylish looking young lady on it and the stuff he wrote—say!—if you didn't know better you'd think any homely Dumb Dora, if she wanted to be a movie queen, all she'd got to do was drink a quart of milk a day. 'Well,' I said, 'that's a nice looking young lady, all right, but you don't really believe that stuff, do you?' 'Oh,' he says, 'it's more or less true.' And it was: more or less. 'I'll tell you,' he says, 'it's just like commercial advertising. You can't expect to get anywhere,' he says, 'if you stick to facts. You've got to exaggerate a little.'

"I didn't tell him this but it made me think of the old story about the fellow that went into the restaurant with the sign on it—'The Kind of Coffee Mother Used to Make.' He asked the waiter, he says: 'Are you sure this coffee here is the kind mother used to make?' The waiter said it sure was. 'All right,' he says, 'give me tea.' And that's the way I feel about it: if that's 'commercial advertising,' I'll stick to the truth. I may be a little old-fashioned but I figure it's better business—in the long run, anyway.

"Yes, it's awful easy, when you're full of enthusiasm for some new project—it's like putting the biggest apples on the top of the basket—when you're anxious to make a sale, it's a temptation to put all the arguments for it on the top and sort of stick the objections down at the bottom, out of sight. But it don't pay. You don't have to sell a community more'n about one gold brick and the next time you show up you're liable to have the dog set on you before you get past the front gate."

The Hospital (The Clinic) Needs a Bulletin—Florence S. Hyde states the case in "The Hospital Bulletin as a Valuable Educational Medium" in *Hospitals*, American Hospital Assn., 18 E. Division St., Chicago, Ill. Sept., 1937. 50 cents.

Read the article for the reasons why, many of which seem to apply to clinics, sanatoria, and other agencies. The italics below make a good point in department as well as institution organs.

"Regardless of its nature and scope, subject matter published in a hospital bulletin should be non-technical in the main. When it seems desirable to use medical or technical terms their meaning should be made clear in the context. The only place in our Presbyterian Hospital Bulletin in which we use medical

terms without definition is in items quoting topics of addresses given at professional meetings by staff men and those mentioning articles contributed to professional journals.

"The style of presentation both as to copy and layout should strike a popular note while retaining a certain undertone of dignity and seriousness. Headlines should be written with a view of intriguing the interest of the reader in the article or item that follows. Long articles are not desirable and when their use seems unavoidable, sub-heads should be used freely. *It usually is possible to avoid lengthy articles by covering different phases of a subject or describing different activities of a department in several short articles under separate headings.* The plan of featuring a certain department or phase of hospital service in each issue has been followed in the Presbyterian Bulletin and has met with general approval. However, it is essential that adequate space be reserved for current news items about other departments, activities of groups that aid the hospital, affiliated agencies, medical staff, and personnel. An appropriate poem and a bit of pertinent humor should be used now and then."

Then follow consideration of illustrations, news, and case stories. The paragraphs on circulation are particularly interesting, although we may not quote all of them.

"Circulation among patients currently in the hospital is of timely educational value because these people have their minds centered on what the hospital has done or is going to do for them and a few glimpses behind the scenes will make a lasting impression. If informed that copies of previous issues are available, many patients will ask for these and read them with interest. They also will be glad to have extra copies of the current issue to hand or mail to friends who will read them with interest because so-and-so is in that hospital. Members of different groups interested in the hospital can pass along extra copies to their friends who are likely to read the bulletin with especial interest if received in this manner. An issue featuring a certain department or phase of hospital service may be given wide distribution among the members of a special group or organization interested in or whose interest is sought in behalf of that department or service. It is a decided advantage if the bulletin is of a size that will fold suitably and will not increase the amount of first class postage when inclosed with routine letters to former or prospective patients, contributors and others."

Does the above suggest similar use among clinic patients? Especially interesting is the following:

"Obviously the hospital bulletin is distributed regularly to all members of the medical and nursing staffs, and all other hospital personnel, including housekeeping and kitchen help. Many of the benefits of a business house organ accrue from this distribution and in larger hospitals the bulletin creates a better understanding of the hospital as a whole among employees who know little about what happens outside of their respective departments."

We wish that some one would read the entire article and write something of the same nature on the organ or bulletin of a city health department.

A University Anti-Syphilis Campaign—"The Daily Texan Vs. Syphilis," is a reproduction of articles which appeared in *Daily Texan* on the campus of University of Texas. A foreword says:

The Texan articles are arranged chronologically to show the step-by-step development of the syphilis campaign.

Ed Syers, Editor of the *Texan*, supervised the campaign in its entirety. The State Health Department cooperated with Mr. Syers in research, in preparation of the articles and editorials, and in providing speakers for the three anti-syphilis mass meetings held on the campus.

This pamphlet is being sent you so that you may use the material locally for news stories and health talks. I feel that in the following pages you will find the answer to your questions regarding syphilis, and, if you will use these suggestions, you, too, can arouse interest in a syphilis campaign in your county and city.

Then follows the day by day articles, Jan. 13, 1938, through Feb. 11—under headlines, such as:

Regents To Get
Results of Vote
Students' Assembly
Requests Tests

The series includes statements by health authorities, the Governor of Texas, and the University president;

reports of movie showings and campus discussions, together with numerous photographs and diagrams.

About the reproductions, says Dr. George W. Cox, State Health Officer, State Board of Health, Austin:

These articles are reproduced by multi-lithing. This equipment is owned and operated by this department. You will note in the foreword why we have reproduced all of these articles, and I feel that it is a real contribution to the campaign against syphilis. Additional copies can be secured by your readers upon request.

So "Popular" Science Literature
—Hugh H. Darby, in *Nation*, 20 Vesey St., New York, N. Y., closes a review of "Man, Bread and Destiny," as follows:

The increasing amount of space given to science in our newspapers and periodicals, as well as the frequent use of the word to bolster up advertising claims, has at last impressed some of our less able minds with the demand for "popular" science literature. They approach the job with little writing ability, less knowledge of their subject, and a minimum of comprehension of the basic principles of the scientific method. It is one thing to simplify a concept so that readers without technical knowledge can grasp it; it is another thing to distort for dramatic effect. Able writing in any scientific field must come from men with knowledge of the fundamentals of their subject and a willingness to say that here and there science has not yet explored and that we do not know. It would be a great tragedy if the scientific discipline which has led us so far in the past hundred years were to be debased and discarded, as it well might be, through the abuse of the word "scientific" and the popularization of exaggerated discoveries by those who do not comprehend them."

Staff members as well as executives might help a lot to stem the flow of inaccuracy and exaggeration by a little letter writing. Many such misrepresentations are due more to carelessness than to intentional misstatement. Writers, as well as editors and book publishers need to be put on their guard. If they learn that readers resent such writing,

and that interested citizens are likely to protest publication of error and careless statement, surely there will be sounder and truer writing on health topics.

When we learn through a review in the *Journal*, or otherwise, that a book contains errors, let's write to the publisher, to the author if possible, to the editor of our favorite book review periodical, and to book review editors of our local newspapers. A single paragraph may serve the purpose.

And when we see a book review which fails to bring out the weaknesses of a book, then is the time for writing a letter to the editor.

An aggressive bombardment will put editors and publishers on their guard. Indeed, in the absence of such reminders it is likely that many editors and publishers will not be conscious of their failures in guarding the interests of the public. A book review is to help readers to evaluate a book in terms of their own interests. In failing to bring out errors or significant omissions, a review fails in its main purpose.

Returning to the quotation above, Mr. Darby is over-kind when he seems to limit exaggerated writing to those "with little writing ability." Unfortunately some of our "best minds" with skillful pens do not hesitate knowingly to overstate and to misstate for the sake of color and effect. These much acclaimed writers are far more dangerous than the lesser mediocre ones.

COMMERCIAL GADGETS

Users of gelatin and liquid process duplicators need not be limited to the narrow range of paper we have known to be offered by some of the equipment makers. At least, "Atlantic Duplicator" makes available a line of attractive colored papers in blue, pink, canary, goldenrod, green, huff, and salmon. Before you dismiss the idea of colored paper send for a sample book.

Then consider whether you might not enlarge your use of the duplicator with such papers available. If they lure you ask for letter-size sheet samples for a test. There is an "Atlantic Mimeo Bond" in the same colors. The joint sample book contains practical "How to Improve" suggestions for handling all three types of duplication. Address: Eastern Mfg. Co., 500 5th Ave., New York, N. Y.

The latest device for office cleanliness is a hand-portable (electric) vacuum or blower cleaner for the typewriter, calculating machines, card files, book shelves, and possibly, in the laboratory. Ideal Commutator Dresser Co., 1221 Park Ave., Sycamore, Ill.

Reports will be welcome on gadgets, equipment of any type found useful or otherwise in the make-up of the publicity office, or in developing any of the technics employed in health education or publicity. This is an angle which has been given too little attention.

MAGAZINE ARTICLES

"The Birth of a Baby." 4 pages of stills from the new motion picture. *Life*, 330 E. 22d St., Chicago, Ill. April 11, 1938.

"Blood Bank Saves Money, Time and Lives at Philadelphia General Hospital." *Life*. Feb. 28, 1938.

"Cooperative Medicine," by Kingsley Roberts, M.D. Wage Earner's Health Assn., and other coöperative projects. *Womans Press*, 600 Lexington Ave., New York, N. Y. April, 1938. 20 cents.

"The Rise of Group Medical Practice," by T. Swann Harding. *Christian Century*, 440 S. Dearborn St., Chicago, Ill. April 6, 1938. 15 cents. Social

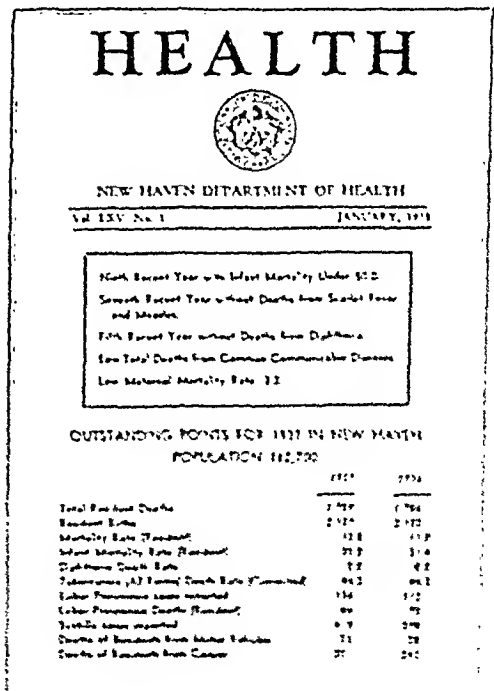
gains; advantages to doctors; profits and necessities; the doctor's choice.

"The Shadow of Insanity." 7 pages about the mentally ill, and the Pilgrim State Hospital, Brentwood, N. Y. "A School for Problem Children." 2 pages on psychiatry as practised at Southard School, Topeka, Kans. *Life*. March 14, 1938.

"The Span of Life," by W. M. Malisoff. Condensed in *Book Digest*, 350 E. 22d St., Chicago, Ill. April, 1938. 25 cents. What might result through "unified research directed toward lengthening the span of life."

"Specs Before the Eyes," by J. C. Furnas. *Saturday Evening Post*. Feb. 19, 1938. Includes paragraphs about the summer use of dark glasses.

"The White Line Isn't Enough," by P. G. Hoffman. *Saturday Evening Post*. March 26, 1938. Causes of road accidents; what to do about them.



A useful cover page

BOOKS AND REPORTS

The Conquest of Cholera, America's Greatest Scourge—By J. S. Chambers, M.D. New York: Macmillan, 1938. 365 pp. Price, \$4.75.

This book is devoted chiefly to cholera in the United States, though the first chapter, *Heritages of 1832*, gives a very good résumé of the history of medicine from the early ages to the present.

The author gives 1832 as the date of the first invasion of the New World by this dread disease, and 1892 as the final conquest of it as far as America is concerned. The author has derived his material from what is evidently a very careful study not only of official documents in the possession of the government, but also from contemporary newspapers and private records. Incidentally, he gives a very good history of steamboat travel on our great rivers and the part they played in spreading the disease from town to town. Stage coaches, emigrant parties, and individual travelers also played a part in carrying the disease to new areas. A good deal of bacteriology outside of that of the disease under discussion is mixed in. There are graphic accounts of a number of the best known epidemics such as those of 1833, 1866, 1873, etc. The Gold Rush of '49 and its contribution to the spread of the disease is also well described.

The book is well documented and the author has evidently given a great deal of careful investigation to the subject on which he writes. It is a fascinating and often gruesome story, and a real contribution to the history of cholera. One finds it hard to realize the dense ignorance of the cause of

cholera so short a time ago. Miasma loomed large in the minds of the medical profession as well as the laity in those days. As far as we know, it is the most complete history of the disease in this country.

The author speaks of it as an "evening fireside concoction, compounded of an homeopathic dose of medical lore in a generous draught of cholera history as a vehicle." The illustrations are excellent and fairly abundant. A number of them are of the great doctors of those times and the frontispiece is a portrait of Dr. Daniel Drake. The style is fluent and easy so that the book makes excellent reading, entirely apart from its historical value. It can be heartily recommended.

MAYCK P. RAVENEL

Legal Medicine and Toxicology—By Thomas A. Gonzales, M.D., Morgan Vance, M.D., and Milton Helpert, M.D. New York: Appleton-Century, 1937. 754 pp. Price, \$10.00.

Out of their extensive experience in the Medical Examiner's Office in New York City, the authors of this monumental work have produced an eminently practical text on the duties and activities of coroners and medical examiners, and the technics employed by them. Thus, in 39 chapters, they discuss identification, autopsies, differentiation of various mortal injuries and types of homicide, sex crimes, blood tests, and the many aspects of toxicology and poisons. The book is illustrated with about 250 excellent, useful, and often gruesome photographs of actual cases selected from the 15,000

that pass through the Medical Examiner's Office in our largest city every year. The book is well printed and has a good index.

This work, which is dedicated to the late Dr. Charles S. Norris, and has a foreword by Dr. Harrison S. Martland, should be of great value to physicians who are concerned officially or professionally with crimes, accidents, violence, and poisons, and it should also be of interest to lawyers, criminologists, and the police. As Dr. Martland says, it is one of the few authoritative works on legal medicine and toxicology in this country. JAMES A. TOBEY

Apes, Men, and Morons — By Earnest Albert Hooton. New York: Putnam, 1937. 307 pp. Price, \$3.00.

This volume is made up largely of "reluctant addresses" given before various organizations and published in scientific as well as lay journals. The introduction is called "Bright Past and Dim Prospect of a Tottering Biped," which brings out the physical disabilities which have come about in man's progress, many of which are recognized by physicians. The chapter, "Apology for Man," is very interesting and not at all flattering to man.

While the entire book is extremely interesting, there are some parts which are particularly valuable to the readers of this *Journal*. In the chapter, "Teeth Through Time," for example, the author holds that "possibly" under the influence of civilization the teeth and mouth have become foci of infection that undermine the entire bodily health of the species. He goes so far as to see in dental disease the cause of degeneration which may ultimately cause the extinction of the human species. While his views are perhaps somewhat extreme, they bear out the increasing interest which hygienists are taking in oral hygiene.

In another chapter, "An Anthro-

pologist Looks at Medicine," the author expresses the belief that the relationships between anthropology and medicine are many and of great value. He recommends an institute for research in applied human biology and believes that norms and variabilities in morphology, physiology, psychology, and neurology should be established, that racial susceptibilities and immunities should be determined, and that the results of the study of human heredity could be applied to medical practice and lay the foundations for a rational science of eugenics.

Some findings are disturbing. Peoples who live on natural food products by fishing, hunting, etc., show the largest number of primitive physical characters, but at the same time the fewest evidences of disease and degenerative evolutionary features. Contact with civilization seems to be always bad. As soon as man shifts to an artificial and agricultural basis of subsistence, physical deterioration seems to set in. While the primitive man does not live as long as we do, he seems to be more free from disease. The biological status of man seems to decline as his culture accelerates. Medical science reduces suffering and prolongs life, but, unfortunately, preserves the malformed, the chronically diseased, and the biologically inferior.

The last chapter sums up what we must do to be saved. The author recognizes that there are many gaps in our knowledge of human biology and that we do not know enough to breed geniuses, but is firm in his opinion that we must bring about a "sit-down reproductive strike of the busy breeders among the morons, criminals, and social ineffectuals of our population." He holds that a biological purge is the essential prerequisite for a social and spiritual salvation. "We must stop trying to cure malignant biological growths with patent sociological

nostrums. The emergency demands a surgical operation."

The book throughout is well worth reading. The author has a sharp tongue and a keen satire. Although the book leaves one with the impression that he is pessimistic over the future, he denies this.

MAZŮCK P. RAVENEL

Bacteriological Atlas—By Richard Muir, enlarged and rewritten by C. E. van Rooyen. (2nd ed.) Baltimore: Wood, 1937. 90 pp., 83 col. pl. Price, \$5.25.

Various improvements have been introduced into the second edition of this much used Atlas, from Edinburgh. By increasing the size of the page slightly, two of the circular colored plates are printed per page so that with an increase in number of plates from 60 to 83 the number of pages is reduced from 134 to 90. By dividing circles into halves, thirds or quadrants, 39 additional figures are shown. Descriptive material is reduced to a minimum as it is expected that the *Atlas* will be used in connection with a textbook.

The color printing is better than in the first edition. Although the plates give an impression of artificiality, they nevertheless, are drawn accurately as to detail and are, as a matter of fact, more satisfactory from the student standpoint than photographs. Dr. van Rooyen, who undertook the work of developing this *Atlas* after the death of Professor Muir has not attempted to give the impression that the drawings were made from preparations examined under a microscope and in his new drawings has utilized the center area only.

In these days when systematic bacteriology is at last making some progress in bringing about an orderly arrangement of the thousands of described species of bacteria, it is unfortunate that the author maintains an ultra conservative position and calls

all rod shaped bacteria *Bacillus* in accordance with the custom popular 50 years ago. Thus, we have *Bacillus coli*, *Bacillus tuberculosis*, *Bacillus diphtheriae*, and the like, in spite of the international action taken by the 2nd (London) International Microbiological Congress, limiting the use of this generic term to spore-forming rods (*J. Bact.*, 33:445, 1937). Some concession is made to modern progress in this field, by inserting commonly used names such as *Escherichia coli*, *Mycobacterium tuberculosis* and *Corynebacterium diphtheriae* in parenthesis. In spite of international acceptance of standardized spellings for scientific names and the fact that the authors who proposed the name *Hemophilus* observed these rules, this name appears as *Haemophilus*. ROBERT S. BREED

Good Housekeeping and Safety in Foundries—Reprint No. 37-30, Management Series No. 1—1937. Chicago: American Foundrymen's Association, Inc. (222 West Adams Street), 1937. 61 pp. Price, \$1.50.

This bulletin contains the proceedings of the 41st Annual Convention Sessions on the subjects in the title and comprises 9 papers: Proceedings of Management Session on Safety and Good Housekeeping; Foot and Leg Protection in the Foundry, by M. W. Dundore, Beloit; The Use of Eye and Respiratory Protection in the Foundry Industry, by John H. Holzbog, Milwaukee; A Consideration of Human Silicosis, by Dr. Norbert Enzer, Milwaukee; Good Housekeeping in the Foundry, by Dr. E. G. Meiter, Employers' Mutual, Wausau; Maintenance of Safeguards in the Foundry, by James Thomson, East Chicago, Indiana; Industrial Codes and Occupational Disease Legislation, by D. M. Avey, Secretary of the Association, Chicago; Industrial Codes and Their Applications, by James R. Allan,

Chicago; and *The Essentials of Occupational Disease Legislation*, by O. E. Mount, Chicago. The Convention was held in Chicago, May 5-6, 1937.

This bulletin, which comprises the ideas and experiences of those actually in the foundry industry or having close contact with it, should be read by all interested in the titles concerned and particularly those interested in silicosis and occupational disease legislation. The articles by Dr. Enzer and Dr. Meiter will be of particular interest to health workers, as each considers especially fundamentals for the bettering of health conditions from the medical economic viewpoint. The bulletin also contains considerable discussion, e.g., by E. B. Kuechle and others on Wisconsin's law (which permits of compensation of non-disabling silicosis), the "dumping" of employees, and labor's viewpoint on medical examinations. EMERY R. HAYHURST

Poisons, Potions and Profits: The Antidote to Radio Advertising—*By Peter Morell. New York: Knight Publishers, Inc., 1937. 327 pp. Price, \$2.00.*

The jacket of this book calls it devastating. There is no question that this is the correct term. It is a pitiless exposition of the false and dangerous claims which are being given to the American public over the radio. It is frankly sickening to read the lists of entertainers, including even the charming Grace Moore, who have lent themselves and their talents to the exploitation of doubtful products and even some which have been found unacceptable and dangerous by competent laboratories and their investigators.

The book ends with what is called a Consumer's Radio Log, some 35 pages, which gives lists of beauty preparations, hand lotions, cigarettes, automobiles, etc., which have been found worthless or dangerous. The

selling price of many of these preparations, especially cosmetics, as related to the costs, is given in tables. What purports to be the New York City Secret Black List of dangerous drugs and cosmetics is given in full.

The book is thoroughly documented and we believe it to be reliable in every respect. In view of the fight which has been going on in Congress for several years and is continuing during the present session, to enact legislation concerning food and drugs which will protect the people financially as well as in regard to their health, this book is especially timely and can be recommended. MAZYCK P. RAVENEL

Biological Laboratory Technique: An Introduction to Research in Embryology, Cytology and Histology—*By J. Brontë Gatenby, Ph.D. (Dubl.), D.Sc. (Lond.). New York: Chemical Publishing Company, 1937. 130 pp. Price, \$3.00.*

While the author of this little volume considers it as "a short and simple introduction to the most recent and established practice in microtomy," he has, nevertheless, written a handbook for the tissue technician. It is amazing how much helpful advice can be packed between the covers of a 130 page book when the style of writing is as concise as that employed by Dr. Gatenby in *Biological Laboratory Technique*. The richness of the author's experience with the various methods of preparing tissues and specimens for study is amply reflected in the pages of this book.

JOSEPH A. KASPER

Reading, Writing and Speech Problems in Children—*By Samuel Torrey Orton, M.D. New York: Norton, 1937. 215 pp. Price, \$2.00.*

This book is a worth while expansion of Dr. Orton's 1925 article in the *Archives of Neurology and Psychiatry*. It should challenge the gen-

eral practitioner and pediatrician to become conversant with the early diagnosis and treatment of speech and writing disorders. With this book as a guide the physician can intelligently instruct the parents whose child presents the problem of left-handedness, baby talk or failure to talk. It should inspire the teacher to a greater acquaintance with the problems of poor writing, spelling, reading, and arithmetic among her pupils. Such an acquaintance would help to reduce the number of "mentally retarded," "nervous," and "incurable" children in the schools. The understanding parent could learn a good deal from the portion of the book in which the author deals with the emotional reactions of these unfortunately misunderstood and neglected children.

Dr. Orton elaborates his subject in a manner which may not at first appeal to a person unfamiliar with or uninterested in neurology. His first chapter deals with "The Language Losses in the Adult as the Key to the Developmental Disorders in Children." This chapter may discourage those who shun precise terminology. However, the author has so simply and logically followed the fundamental patterns described in this chapter that the reader finds the subsequent material expanding and becoming more concise in an effortless fashion. The chapter on the description of the disorders and the final chapter on treatment contribute to clarity by purposeful repetition and summarization.

Educators, physicians in behavior, and mental hygiene clinics, and teachers specializing in speech, writing, and reading disorders, should welcome this much needed book. Directors of nursery schools and preschool centers should be thoroughly familiar with Dr. Orton's views on sidedness and problems relating to changed laterality: it may be in this field that unique pre-

ventive work can be done to reduce the occurrence of these disabilities.

W. F. SCHNEIDER

A Workbook in Health for High School Girls—By Gladys B. Gogle. *New York: Barnes, 1937.* 267 pp. Price, \$1.00.

This workbook presents various health habits for checking, questions to be answered or discussed, and planned problems for which the pupil is to write out the answers.

After many of the units a good bibliography of texts of the proper age level is provided, which enables the teacher to make definite assignments of reading and to develop discussion as a preliminary to written use of the book.

A valuable effort to provide the teacher with a usable procedure.

CHARLES H. KEENE

The Principles and Practice of Clinical Psychiatry — By Morris Braude, M.D. *Philadelphia: Blakiston, 1937.* 382 pp. Price, \$3.50.

Messrs. Blakiston now have two textbooks of clinical psychiatry of the same size and general scope, addressed to the same group of readers. Their earlier text by Strecker and Ebaugh has served and still does admirably serve its purpose. The new text by Braude contains certain differences of emphasis and includes historical references; it relies less upon its case histories which are printed in small type; the bibliographical references are most recent; the literary style is somewhat tiresome and the binding is waterproof.

Health officers are usually more interested in mental hygiene than in clinical psychiatry. But they are sometimes called upon to give evidence in sanity hearings. A chapter on the preparation of evidence for such occasions might perhaps have been fairly included in the textbook under review, since it is addressed to students of the

social sciences and of jurisprudence as well as to students of medicine. No such chapter is to be found.

J. ROSSLYN EARP

Public Health and Hygiene, A Students' Manual—By *Charles Fredrick Bolduan, M.D., and Nils William Bolduan, M.D. (2nd ed.) Philadelphia: Saunders, 1937. 371 pp. Price, \$2.75.*

In the 7 years which have elapsed since the appearance of the first edition and the preparation of the second, many new things which should be incorporated in a book of this sort have come up and the authors have taken advantage of them. This second edition is almost a new work. It has been thoroughly revised, many chapters have been rewritten and 5 new chapters have been added.

It is designed for medical students as a review for their regular courses in public health and hygiene, for college students, graduate nurses, and social service workers. We believe it fulfils the objects for which it is designed in an unusually satisfactory manner, and within its scope it can be highly recommended. The printing and illustrations are good. MAZYCK P. RAVENEL

Principles of Medical Statistics—By *A. Bradford Hill, D.Sc., Ph.D. London: The Lancet, Ltd., 1938. 171 pp. Price, \$2.25.*

This is a balanced, well written book on elementary statistics. It was originally prepared at the invitation of the editor of the London *Lancet*, in the form of a series of short articles for that publication. The book was addressed primarily to the physician, but it will also be found an excellent introduction to statistics for the health worker. Although small, as scientific books go, this book includes discussion of some important subjects frequently omitted or slurred over in statistical texts.

The chapter headings include, among others, selection, presentation, variability and standard deviation, averages, three chapters on sampling including a discussion of chi square, correlation and life tables. One of the most useful features of the book is the 3 chapters, packed with useful advice, on common fallacies and difficulties. Most persons could read these chapters at the outset, and again at the end.

The appendix includes a 2 page table of chi square, and 3 pages of definitions and formulae. A. W. HEDRICH

The Biology of Pneumococcus—By *Benjamin White, Ph.D., with Elliott Stirling Robinson, M.D., Ph.D., and Laverne Almon Barnes, Ph.D. New York: Commonwealth Fund, 1938. 799 pp. Price, \$4.50.*

Pneumococcus is altogether an amazing cell. Tiny in size, simple in structure, frail in make-up, it possesses physiological functions of great variety, performs biochemical feats of extraordinary intricacy and, attacking man, sets up a stormy disease so often fatal that it must be reckoned as one of the foremost causes of human death.

Thus, in two compact sentences, Dr. White justifies an interest in, and a concern over, this microorganism that is sufficient to bring forth a book of the size and scope of *The Biology of Pneumococcus*. In the following paragraphs of his introduction, he points out the rôles played by the sanitarian, pathologist, epidemiologist, physician, bacteriologist, immunologist, and chemist in the battle against the "stormy disease."

The authors have compiled into one volume the results of years of research by the various workers and have given us a complete review of the literature on this subject. The history of research relating to the pneumococcus is described, beginning with its discovery in 1875, continuing on with a discussion of all the work that has been done up

to the present time, and suggesting problems yet to be solved. The bacteriological, biochemical, and immunological characteristics of the organism are dealt with at length. The chemotherapy, vaccine and serum therapy of pneumonia form no small part of the book.

The appendix is a part of the book that every laboratory worker should value. Directions for various laboratory procedures are given: methods for the preparation of media, for the isolation of the pneumococcus, for typing, and for the isolation of the component parts of the pneumococcus. There, too, are given directions for the preparation of antipneumococcus serum, including serological reactions, potency, and sterility tests.

The bibliography includes nearly 1,600 references and embraces practically everything that has been written about the pneumococcus.

The Biology of Pneumococcus is not only an excellent reference book; it makes a very readable story as well. It is a book that only a person of Dr. Benjamin White's type could produce. It reflects his sterling scientific acumen, and capitalizes his extensive experience and his extraordinary capacity for doing a task completely and thoroughly.

WILSON G. SMILLIE

Milestones in Medicine—Introduction by James Alexander Miller, M.D. New York: Appleton-Century, 1938. 276 pp. Price, \$2.00.

This book is made up of the "laity lectures of the New York Academy of Medicine." The Introduction by Dr. Miller, President of the Academy, says that these lectures "are unique in that by an historical presentation of the development of medicine's ideologies, knowledge and techniques, not only the established facts are presented, but also the sequence of and reasons for their evolution."

The book does not lend itself readily to review. Each lecture has been given by a master in that special field to which it is devoted, and each is complete in itself.

Needless to say there is an enormous amount of valuable and interesting material given. We cannot but think that one or two lectures, at least, will make pretty hard reading for the average layman, although the material is as simply and plainly put as is possible considering its content. The book is to be thoroughly commended. The printing and make-up are excellent.

MAZÏCK P. RAVENEL

Toxicology—By William D. McNally, A.B., M.D. Chicago: Industrial Medicine, 540 No. Michigan Ave., 1937. 1022 pp. Price, \$10.00.

A Foreword by Dr. Carey P. McCord emphasizes that civilization may be measured by the number of poisons man has discovered, obviously for his use but seriously to his risk. Toxicology is the branch of medicine which nearest approaches an exact science and, as such, the present book is singularly free from the ancient thralldom of the occult.

The work is intended as a modern text for the medical and legal professions. The subject matter has been the bases of a course of lectures and the sources have included standard texts and reference works as well as original literature. Peterson, Haines, & Webster's *Legal Medicine and Toxicology* is the first mentioned text-authority, Henderson and Haggard's *Noxious Gases*, the next, etc., but other American and foreign texts have been given due cognizance.

General Considerations (58 pages) classifies the poisons, their mode of entry, diagnosis, general treatment, methods of detection, common forensic questions, and post-mortem appearances. *Inorganic Poisoning* (24 pages)

covers the corrosives. *Metals and Non-Metals* (223 pages) goes exhaustively into 28 substances with, of course, much space devoted to lead, mercury, arsenic, and their compounds. *Gaseous Poisons* (145 pages), naturally emphasizes carbon monoxide, nitrogen oxides, and the refrigerants. *Alkaloidal Poisons* (155 pages) includes many of the newer ones, even to tremetol ("milk sickness") and sulphanilamide. *Volatiles, Distillates, and Solvents* (99 pages) includes the petroleum distillates, the alcohols, acetates, aldehydes, and certain chlorinated hydrocarbons such as carbon tetrachloride. *Drugs and Miscellaneous* (167 pages) comprises a long list, including the newer local anesthetics. There follow *Food Poisoning and Food-Borne Infections* (19 pages); *Death from Powdered Glass* (4 pages); the medicolegal aspects of *Blood and Seminal Stains* (57 pages); *Hair and Other Fibers* (73 pages); *X-rays and Other Forms of Radiant Energy*—a special chapter by Hollis E. Potter (6 pages); *Silicosis and Asbestosis*, especially in relation to their determination and methods of collection (13 pages); and a final half-dozen pages devoted to *Radium, Bites and Stings*, and *Wax*.

Turning practically to any page, one gains the impression of much said in a few words, definiteness of statement, and wholesome inclusion of the literature; for example, the 10 pages devoted to *Nitrogen* and its *Oxides*. Fortunately, nearly all references are footnoted on the given page of the text, and numbered consecutively.

Some subjects, like *carbon monoxide*, have a tremendous literature and despite nearly 200 references cited, one can readily think of others which might have been included. The collection of the vast amount of material on such a subject is difficult so that here, as elsewhere, the reader finds much confusion in arrangement, lack of index

facility, and oftentimes is unable to distinguish between citations and the author's own discussions and evaluations. Some typographical errors, lack of desired details, and over-inclusive statements appear.

Under *lead poisoning*, very limited space is given to the acute form (which is probably well conceived) while the author uses the Fairhall method for lead detection, omitting description of the much more sensitive dithizone and spectroscopic methods, the former of which is widely used.

In general, citations can be readily found to serve either side of a medicolegal controversy, but recourse to the original literature cited may often explain why "this is not the same kind of a case."

Sixty-five valuable tables are scattered throughout the text and there are 29 illustrations and 4 colored plates. There is a detailed table of contents, but an all too brief index.

The book is handsomely bound in substantial stiff covers and printed in "excelsiora" type, claimed to be accepted by experts as easiest to read.

Unquestionably it is a leader in the industrial toxicological field and is indispensable to all interested in toxicology and its medicolegal aspects.

EMERY R. HAYHURST

Not So Long Ago—A Chronicle of Medicine and Doctors in Colonial Philadelphia—By Cecil K. Drinker, M.D. New York: Oxford University Press, 1937. 183 pp. Price, \$3.50.

This book is founded on the well known diary of Elizabeth Drinker, kept from 1758 until a few days before her death in 1807. The first two chapters describe life in Philadelphia in those early days, whereas most of the others give a good picture of deplorable sanitary conditions, lack of sewerage systems, pure drinking water, etc. One

of the most grotesque yet interesting stories is that of a well which was supposed to have curative properties as mineral water and was widely used, yet turned out to be connected with a cess-pool, which was discovered only when the well was exhausted on account of the quantity of water taken from it. The book is valuable as giving quite intimate pictures of the great medical men of that time, like Benjamin Rush,

William Shippen, John Bard, Adam Kuhn, Philip Syng Physick, and others.

The book is well printed and has most interesting illustrations, chiefly pictures of the great men whose stories are recorded in the diary. As a contribution to colonial history as well as to medical history of that period, it can be highly recommended.

MAZÛCK P. RAVENEL

BOOKS RECEIVED

MANUAL FOR WATER WORKS OPERATORS. Prepared by the Texas Water Works Short School. Texas: State Department of Health, 1938. 278 pp.

FIT TO TEACH. NINTH YEARBOOK. Department of Classroom Teachers. Washington: National Education Association, 1938. 276 pp. Price, \$1.00.

PRINCIPLES AND PRACTICE OF BACTERIOLOGY. By Arthur H. Bryan. New York: Barnes & Noble, 1938. 267 pp. Price, \$2.25.

MARIHUANA. THE NEW DANGEROUS DRUG. By Frederick T. Merrill. Washington, D. C.: Foreign Policy Association, Inc. 1938. 48 pp. Price, \$15.

NUTRITION OF THE INFANT AND CHILD. By Julian D. Boyd. New York: National Medical Book Co., 1937. 198 pp. Price, \$3.00.

MILESTONES IN MEDICINE. Laity Lectures of the New York Academy of Medicine. Introduction by James Alexander Miller. New York: Appleton-Century, 1938. 276 pp. Price, \$2.00.

SPECTROSCOPY IN SCIENCE AND INDUSTRY. Proceedings of the Fifth Summer Conference on Spectroscopy and Its Applications. Massachusetts Institute of Technology, Cambridge, Mass., July 19-22, 1937. New York: Wiley, 1938. 134 pp. Price, \$3.00.

THE SPAN OF LIFE. By William Marias Malisoff. Philadelphia: Lippincott, 1937. 339 pp. Price, \$2.50.

THE TRUTH ABOUT CHILDBIRTH. By Anthony M. Ludovici. New York: Dutton, 1938. 294 pp. Price, \$2.50.

CIVILIZATION AND DISEASE. By C. O. Don-nison. Baltimore: Wood, 1938. 222 pp. Price, \$3.00.

FIFTY YEARS A COUNTRY DOCTOR. By Wil-

liam N. Macartney. New York: Dutton, 1938. Price, \$3.50.

SAFEGUARDING MENTAL HEALTH. By R. C. McCarthy. Milwaukee: Bruce, 1937. 297 pp. Price, \$2.50.

HELP YOURSELF TO HAPPINESS. By David Seabury. New York: McGraw-Hill, 1937. 345 pp. Price, \$2.50.

SUCCESSFUL LIVING. By W. Béran Wolfe. New York: Farrar & Rinehart, 1938. 180 pp. Price, \$2.00.

SYPHILIS, GONORRHEA AND THE PUBLIC HEALTH. By Nels A. Nelson and Gladys L. Crain. New York: Macmillan, 1938. 359 pp. Price, \$3.00.

FEARFULLY AND WONDERFULLY MADE. The Human Organism in the Light of Modern Science. By Renée von Eulenburg-Wiener. New York: Macmillan, 1938. 472 pp. Price, \$3.50.

SOYBEANS. A BRIEF TREATISE ON MODERN NUTRITION. By N. A. Ferri. Chicago: Modern Health Foundation, 1938. 62 pp. Price, \$35.

OCCUPATIONAL DISEASE SYMPOSIUM. Chicago: Northwestern University Medical School, 1937. 86 pp.

NEW SPENCER PRECISION MICROTOME CATALOG. Catalog containing presentation of rotary, sliding and clinical microtomes and their applications. Copy free on request to Dept. J, Spencer Lens Company, Buffalo, N. Y.

REPORT TO THE STATE PLANNING COUNCIL OF NEW YORK ON THE PROBLEMS CREATED BY THE PREMATURE SUBDIVISION OF URBAN LANDS IN SELECTED METROPOLITAN DISTRICTS IN THE STATE OF NEW YORK. By Philip H. Cornick. Albany: Division of State Planning, 1938. 346 pp. Price, \$1.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Health Administration and Physical Fitness—Among the things that the British do better than we is taking a subject apart to see what makes it tick. At a council meeting the subject was school health. In the United States, such a meeting would have been given over to statistics of defects found, ways of inducing children to brush their teeth, and other trade practices. Not so there. The discussion turned on national fitness, organized athletics versus hygiene, the condition of the working classes, the true value of the "physical jerks," and a dozen other lively social topics. A good time was had by all.

AXON. *The Health of the School Child*. J. Roy. San. Inst. 1, 6:325 (Mar.), 1938.

Rural Tuberculosis Prevention—Because isolation of open cases is of so much more value where exposure to mass infection is slight, rural health authorities are urged to get busy with a case finding and case supervising campaign. Cattaraugus County has shown the way.

ATWATER, R. M. *The Control of Tuberculosis in Rural Areas*. Canad. Pub. Health J. 29, 2:53 (Feb.), 1938.

Least Expensive Optimal Diets for Babies—Excluding meat from the youngster's diet and keeping fats and sugars low are the principal factors in building up a satisfactory diet at minimum cost. Milk, eggs, vegetables, and fruit are much the same in all diets, though practical economies in the purchase of the last are suggested.

BALL, V. K. *Low Cost Diet in Babyhood*. Pub. Health Nurs. 30, 3:137 (Mar.), 1937.

Early Diagnosis of Measles—In reading this discussion of the differences in the inclusion bodies found in the specimens from nose and throat of patients suffering from measles and those from other diseases, including colds, influenza, and poliomyelitis, one gets the impression that much research lies ahead of the bacteriologists who would come to the aid of the epidemiologist in controlling measles.

BROADHURST, J. *The Early Diagnosis of Measles*. Am. J. Nurs. 38, 3:251 (Mar.), 1938.

More Scarlet Fever Prophylaxis Than You'd Expect—Canvassing 9,000 families in 130 localities, the attacks of scarlet fever, among other conditions, were recorded. A surprisingly large proportion, 4 per cent, of 10 to 11 year old children were reported to have been immunized against the disease. Of 208 cases occurring (during the period under survey) among children under 15 years, 3 were second attacks, and 2 were in immunized children. The remaining 203 children had not been immunized or had not had previous attacks. Statistically these figures may be insignificant, but they are interesting nevertheless.

COLLINS, S. D. *History and Frequency of Clinical Scarlet Fever Cases and of Injections for Artificial Immunization among 9,000 Families, Based on Nation-wide Periodic Canvasses, 1928, 1931*. Pub. Health Rep. 53, 11:409 (Mar. 11), 1938.

Dental Health Attitudes—Beginning with 9 dental untruths certified by the woman's magazine carrying the advertisements, the author discusses the

lack of adequate and authentic dental health education. General dental knowledge is a curious mess of fact, folklore, proprietary and food product advertising, and most school teachers seem to get their information from the same sources. Only 6 truths need be taught.

EASLICK, K. A. Dental Health Education—Can School Children Get It? *J. School Hyg. S.* 3:68 (Mar.), 1938.

Research in Diphtheria Prophylaxis—Sound studies made upon immunity responses to diphtheria prophylactics show a higher degree of immunity when 3 doses of unmodified toxoid are used than when other products were used in any combination. Field studies, too, show a better end result when 3 doses are used instead of 2.

FITZGERALD, J. G., *et al.* Diphtheria—A Preventable Disease. *Lancet.* 1, 7:391 (Feb. 12), 1938.

Bacteriophage Still Tantalizes Research—Although houseflies normally harbor bacteriophage, when reared in a sterile environment, they produced no phage against a susceptible organism fed to them. On the other hand, when fed the phage without the homologous organism, the phage would not persist as it does for many generations when combined with the bacterium. These results indicate that phage is not the result of interaction of bacteria and animal host as has been proposed.

GLASER, R. W. Test of a Theory on the Origin of Bacteriophage. *Am. J. Hyg.* 27, 2:311 (Mar.), 1938.

Teaching Home Safety—Popular ways of meeting the grim reaper in your home are presented realistically. Half the accidental deaths are due to falls, as always. Burns and scalds come next, and make up in suffering what they lack in numerical strength. As

with burns, children are the chief victims of accidental poisoning. Gas and mechanical suffocation and electrical shock continue to add a respectable quota to the holocaust.

MELPOLNER, J. Hazards in the Home. *Pub. Health Nurs.* 30, 3:165 (Mar.), 1938.

White Men's Diseases and Negroes—The 12 million spent to fight syphilis seems like quite a sum until one remembers that 10 million are spent annually to care for the syphilitic blind and 32 for the syphilitic insane. What should be done for both syphilis and tuberculosis in both the white and negro populations is strikingly told.

PARRAN, T. No Defence for Any of Us. *Survey Graphic.* 27, 4:197 (Apr.), 1938.

Dead Men Tell Tales—Calling attention to the fact that Chapin found the relation of sickness incidence and tax paying ability to have been about the same 75 years ago in Providence as the recent nation-wide survey disclosed among our modern poor (the 40 to 50 million American people living upon a family income of less than \$1,000), the author presents all the statistics you will ever need about illness in the latter group. He pleads for better statistical services from welfare agencies.

PERROTT, G. St. J. Health Problems of Low Income Families. *Health Officer.* 2, 10:488 (Feb.), 1938.

"Train Up a Child"—If confession really benefits the soul, this author may now boast a grade A article. Recalling the days when he held that doctors and dentists were proper authorities to "lecture" school children on their health behavior, he recounts his conversion to the belief that teaching should be done by teachers who are properly equipped to teach. A fine Canadian program to meet this situation is outlined.

PHAIR, J. T. An Experiment in Health Teaching in Ontario. *J. School Health,* 8, 3:73 (Mar.), 1938.

A Tooth for Every Child?—

No evidence is discovered by this author to establish a correlation between calcium metabolism of the body and dental caries in the adult tooth, nor is proof found of the increased incidence of caries because of metabolic changes during pregnancy. Growing teeth only are affected by calcium disturbance. If these findings are true, health educators will find themselves out upon still another limb.

SCHOUR, I. Calcium Metabolism and Teeth. J.A.M.A. 110, 12:870 (Mar. 19), 1938.

Sunlight Injures Pellagrins —

Briefly reviewing the high spots in the research upon the cause of pellagra since Goldberger's classic demonstration of the possibility of causing the disease by deficient diet, the place of exposure to the sun in producing symptoms is made clear. Modern treatment methods are also discussed. The history and incidence of the disease are covered in a long editorial in the same publication based upon an address by W. H. Sebrell.

SMITH, D. T. Present Knowledge of Pellagra: Clinical Studies. J. Am. Dietetic Assoc. 14, 3:168 (Mar.), 1938.

Two Years of Premarital Tests

—During the time Connecticut's premarital law has been in operation, 1 candidate for marriage in each 50 has been found to be syphilitic. In the first year of operation, marriages fell off, but the second year found them on the way back to normal. It is to be hoped that this measured statement will have wide reading by the alarm-viewers and doubting Thomases.

TALBOT, H. P. Results of Premarital Blood Tests—1936 and 1937. Connecticut Month. Health Bull. 52, 2:39 (Feb.), 1938.

Revised Technic for Sunshine Measure—Using the principle de-

pendent upon the property of ultra-violet light to decompose certain chemicals in proportion to intensity, a practical apparatus is described and suitable technics are proposed. With it climatic surveys of actinic sunshine may be made in any community.

TONNEY, F. O., and SOMERS, P. P. A Complete, Revised Technic of Actinic Sunshine Analysis, with Modifications for Freezing Weather and Near Meridian Exposures. Am. J. Hyg. 27, 2:370 (Mar.), 1938.

How Syphilis Is Treated—Some

of many observations on syphilis culled from an exceedingly valuable Chicago survey: 59 per cent of those who acquire syphilis do so before age 30; of patients with a positive blood test at the end of treatment, 3 per cent had a relapse, while of those with a negative test, 4 per cent had relapsed; of the women patients, 11 per cent became pregnant after infection; in half these cases, the infection was not detected until after the 5th month, and of those that were discovered early, only 21 per cent were adequately treated. Does anyone doubt the need of adequate anti-syphilitic measures?

USILTON, L. J., *et al.* Prevalence, Incidence, and Trend of Syphilis in Chicago. J.A.M.A. 110, 12:864 (Mar. 19), 1938.

Our First National Public Health

Program—What public health protection did the United States obtain from the 8¾ millions appropriated to the states under the terms of the social security act during its first full year of operation? Rural counties showed a net gain of 331 full-time health units, 1,500 individuals received postgraduate training, and the long list of projects undertaken in all the states of the union is an imposing one. But the most inspiring fact is the plan for the future.

WALLER, C. E. A Brief Review of Progress in the Public Health Program. Health Officer. 2, 10:472 (Feb.), 1938.



"The Scout"—statue by Cyrus E. Dallin. Skyline of downtown Kansas City in background.

KANSAS CITY INVITES YOU

ALL the world knows Kansas City as the "Heart of America" lying just 9½ hours by air from Los Angeles or 6½ hours from New York. Here at almost the exact geographical center of the United States a network of paved highways and trunk-line railroads converge providing speedy and direct transportation to all principal cities.

Most of Kansas City's leading hotels are compactly located within three blocks of the Municipal Auditorium or the heart of the shopping district.

Kansas City's Municipal Auditorium will serve as convention headquarters of the A.P.H.A., and description here becomes a bit difficult without the use of superlatives. Constructed at a cost of approximately \$6,500,000, the auditorium is one of a trio of recently completed municipal buildings. Though still pungent with the odor of new paint and fresh plaster, the auditorium has proved to be one of the most adaptable convention buildings in the country. By effective use of color and modern indirect lighting it aptly demonstrates the possible combination of beauty and utility in public buildings.

Thirty-two units range in seating capacities from 25 to 14,000 and may

be used separately or closely knit together by means of a public address system. Major units comprise the main arena seating 14,000, the Music Hall seating 2,650, the Little Theatre seating 600; and an exhibit hall containing 120,000 square feet of exhibit space. Facilities and services provided for exhibitors are sure to leave them in a happy frame of mind!

These are the convention essentials, but as no trip is complete without exploring some of the surrounding territory, what of the city itself?

Whether you appreciate fine paintings, enjoy good music, have a mechanical bent, or seek sheer recreation and entertainment, we know you will enjoy Kansas City.

In coming to the middlewest your hosts hope that you will feel you are among friends and that Kansas City will truly reflect the spirit of those who live and work here.

Under the able guidance of Health Director Dr. E. H. Schorer, plans are being made for a number of special tours and side-trips interesting from a professional standpoint. These will be described in future issues of the *Journal*.

For those who want to pursue their

individual hobbies, however, the following may constitute a sort of "vest pocket" guide. Even the briefest of exploration reveals that Kansas City is today essentially an agricultural distributing center made possible by a strategic location and ease of transportation.

Long before the days of paved roads, streamlining, or air-travel, men with high heel boots, ten-gallon hats, and clicking spurs were driving great herds of long horn cattle to Kansas City markets—markets which have now become well known for breded cattle exhibited each fall in the American Royal Livestock Show.

Vast fields of golden wheat were harvested and transported to mid-western elevators for storing and milling. These fields have earned Kansas City its reputation as the nation's "breadbasket" — and the leading market for primary winter wheat.

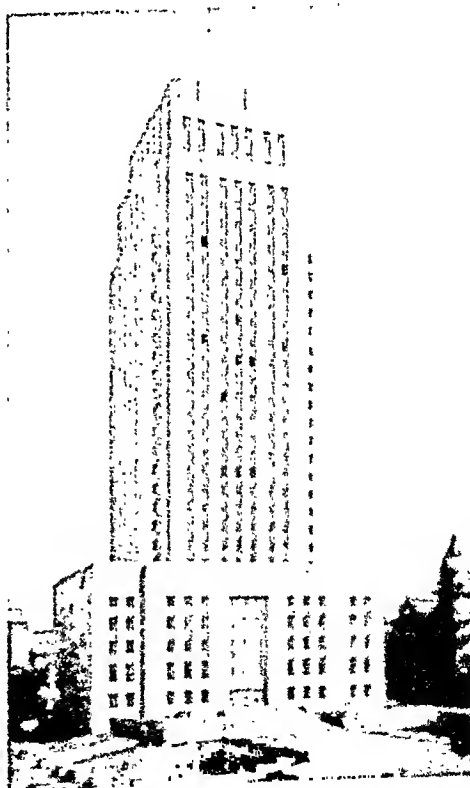
Long recognized as an agricultural center, the industrialist soon added his tribute. Sprawling pipelines were extended from Kansas, Oklahoma, and Texas to bring crude petroleum for refining; manufacture of corn products in Kansas City was "a natural," and soap, paint, and varnish manufacturers brought their plants here until more than 875 factories are represented in the Kansas City skyline. Today, long automobile assembly lines must be kept moving, and blast furnaces kept hot with molten steel.

To provide recreation and diversion for these people, such early builders as the late August R. Meyer, William Rockhill Nelson, and George E. Kessler planned and developed the now famous Kansas City park and boulevard system—a system which includes Cliff Drive, inviting Penn Valley Park, the 1,400 acre Swope Park, and the winding drives of the Country Club Residential district.

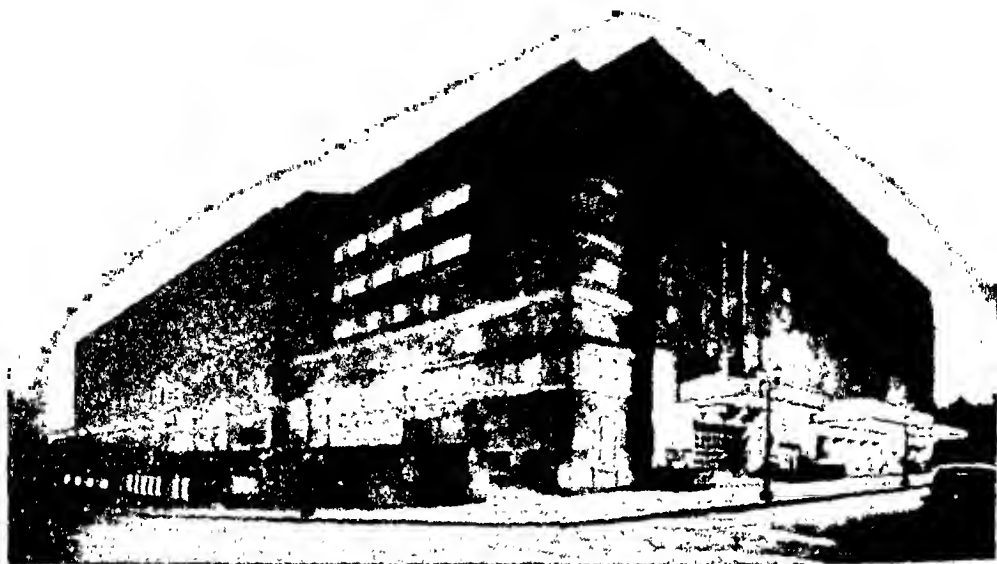
More recently, under a \$32,000,000

Ten Year Plan for Public Improvement, Kansas City has assumed its obligation as the artistic and cultural center of the great midwestern area it serves. Evidence might be found in the ready support given the Kansas City Philharmonic Orchestra, in the William Rockhill Nelson Gallery of Art and Mary Atkins Museum, or in any of the recently completed new municipal buildings — the Jackson County Court House, the Federal Post Office, the Municipal Auditorium, or the towering thirty story City Hall.

Within a block of the Municipal Auditorium is the Kansas City Power and Light Building which houses a small broadcasting station, television laboratories, and the Lighting Institute. Special studies have been made of color effects with reference to visibility, and a complete visual history of the lighting industry from the invention of



City Hall, Kansas City



Municipal Auditorium—Meeting Headquarters, A.P.H.A.

the first Edison bulb, is on display here. Visitors are welcome at any time and will be furnished guides between 9 A.M. and 3 P.M.

Proceeding south from downtown Kansas City, World War veterans will want to inspect the Liberty Memorial—a combined monument and building erected in honor of Kansas City's war dead. When seen after dark the 537 foot shaft constitutes a picture of great natural beauty rising on a series of terraces on which lighted fountains are directed. All Kansas City's skyline unfolds when viewed from this great height. This is in sharp contrast, however, to the wealth of factual information, maps, and war instruments contained within the memorial—a collection which merits several hours' browsing.

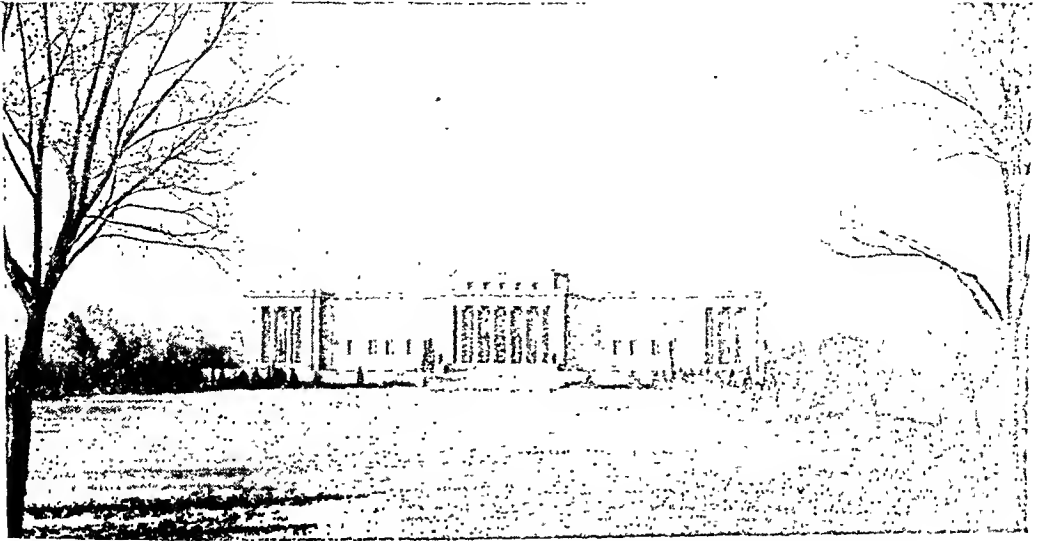
Directly across the street from the Memorial is the massive gray stone Union Station, popular with resident Kansas Citians and visitors alike. In addition to its extensive terminal facilities, there are always the latest books and magazines; an inviting gift shop

with the newest in gifts; a variety of toys for younger members of the family; and if one is hungry or thirsty, the Westport Room with cocktails, sizzling Kansas City steaks, and Fred Harvey's coffee.

If we continue our drive to the south we go through restful Penn Valley Park, home of Cyrus E. Dallin's Scout and A. Phimister Proctor's sculptural group, "The Pioneer Mother." Penn Valley forms a picturesque link between downtown Kansas City and its outlying shopping areas.

Largest and most outstanding of these is the Country Club Plaza, ever seasonable and festive in its decoration, and Spanish in its architecture. The Plaza, which serves Kansas City Country Club Residential District, is a complete and inviting miniature city in itself—served by its own residential parks, golf courses, bridle paths, playgrounds, and gardens.

It is said that the index to any city may be found in its homes. If this is true, a few hours spent in driving over the Country Club District justifies



William Rockhill Nelson Gallery of Art and Mary Atkins Museum, Kansas City

all Kansas City's claims to many of the nation's most beautiful homes, combining the charm of European gardens and art objects with the freshness and sense of infinite space so characteristic of the middle west.

Those with cultural interests will want to explore the building and

grounds of Kansas City's rapidly growing 6 year old University of Kansas City, the Kansas City Art Institute, or pay a leisurely visit to the William Rockhill Nelson Gallery of Art and Mary Atkins Museum.

Made possible by the bequests of Mrs. Mary Atkins and William Rock-



Overlooking the lake in Penn Valley Park, Kansas City

hill Nelson, founder of the Kansas City Star, the Gallery is erected on the grounds of Mr. Nelson's former residence, Oak Hall. More than 5,000 objects of art from the earliest civilization of Asia Minor to contemporary 20th century art are exhibited. A distinctive feature is the installation of original old panelings with complete furnishings of the period. These include an English Georgia drawing-room, a French Regina Salon, a Spanish Italian room, and an Early American wing of five interiors brought from various sections on the Atlantic coast.

The department of paintings already ranks fifth among museums of the United States and includes outstanding works by Titian, Tintoretto, Veronese, Rembrandt, Rubens, Hals, El Greco, Velásquez, Goya, Poussin, Chardin, Boucher, Greuze, Millet, Gainsborough, Reynolds, Raeburn, Copley, West, Stuart, and Inness.

Gone is the idea of a museum as a

sort of morgue filled with dim and gloomy objects out of the past. Instead, the air-conditioned scientifically lighted Kansas City Gallery achieves the effect of a series of small intimate rooms with art objects appropriately grouped as they typify life in that particular period.

Ample opportunity for outdoor sports is afforded in Kansas City's Swope Park—the third largest municipal playground in the world. Its 1,400 acres of rustic woodland, three golf courses, tennis courts, picnic grounds, shelter houses, natural footpaths, outdoor animal pits, zoo and lagoon for swimming and boating afford interest and entertainment for groups of all ages and tastes.

So for the sake of your professional interests and your own entertainment mark *October 25-28* as "red letter dates" on your calendar, and select your favorite mode of transportation. All roads lead to Kansas City!



A. Phimster Proctor's "Pioneer Mother"

HEADQUARTERS FOR THE SIXTY-SEVENTH ANNUAL MEETING KANSAS CITY, MO.—October 25-28

THE beautiful and commodious Municipal Auditorium will be used as meeting headquarters when the Association convenes for the 67th Annual Meeting in Kansas City. All scientific sessions, except breakfasts, luncheons, and dinners, will be scheduled here.

Registration and Information, commercial and scientific exhibits, Health Education and Publicity Headquarters will all be located in the Auditorium.

Residence headquarters are the Hotels Muehlebach, President, and Kansas Citian, each situated within

three blocks of the Auditorium. The members of the Vital Statistics Section and of the American Association of State Registration Executives have signified their intention of centering at the Hotel President. None of the other Sections or organizations meeting with us has named a headquarters and there will be a liberal sprinkling of all in-

terests in the three hotels. Single rooms will be difficult to obtain if reservations are long delayed. A list of Kansas City hotels with their rates is published on page 676 together with a reservation form. Fill it in now and mail it to the Chairman of the Housing Committee, Dr. Ralph Duncan, 1028 Baltimore Avenue, Kansas City, Mo.

APPLICATION FOR HOTEL ACCOMMODATIONS

In making application for hotel accommodations, it is necessary that four choices of hotels be indicated and that a reasonable range of rates desired be shown. Whenever possible, arrangements should be made for occupancy of double rooms; only a limited number of single rooms are available

HOUSING COMMITTEE
1028 Baltimore Avenue
Kansas City, Missouri

Date.....

Please make hotel reservations noted below:

Hotel First Choice Hotel Third Choice

Hotel Second Choice Hotel Fourth Choice

...Double Rooms with bath for persons.Rate desired \$... to \$... per day

...Single Rooms with bath.....Rate desired \$.. to \$.. per day

...Suites—Parlor, ...Bedroom(s) with bath for ... persons. Rate desired \$... to \$... per day

Special Instructions

.....

.....

Arriving, hourA.M.P.M. Leaving .. .

If the hotel of first choice is unable to accept the reservation, the Housing Committee will endeavor to comply with your second, third or fourth choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

NAME	STREET ADDRESS	CITY	STATE
.....
.....
.....

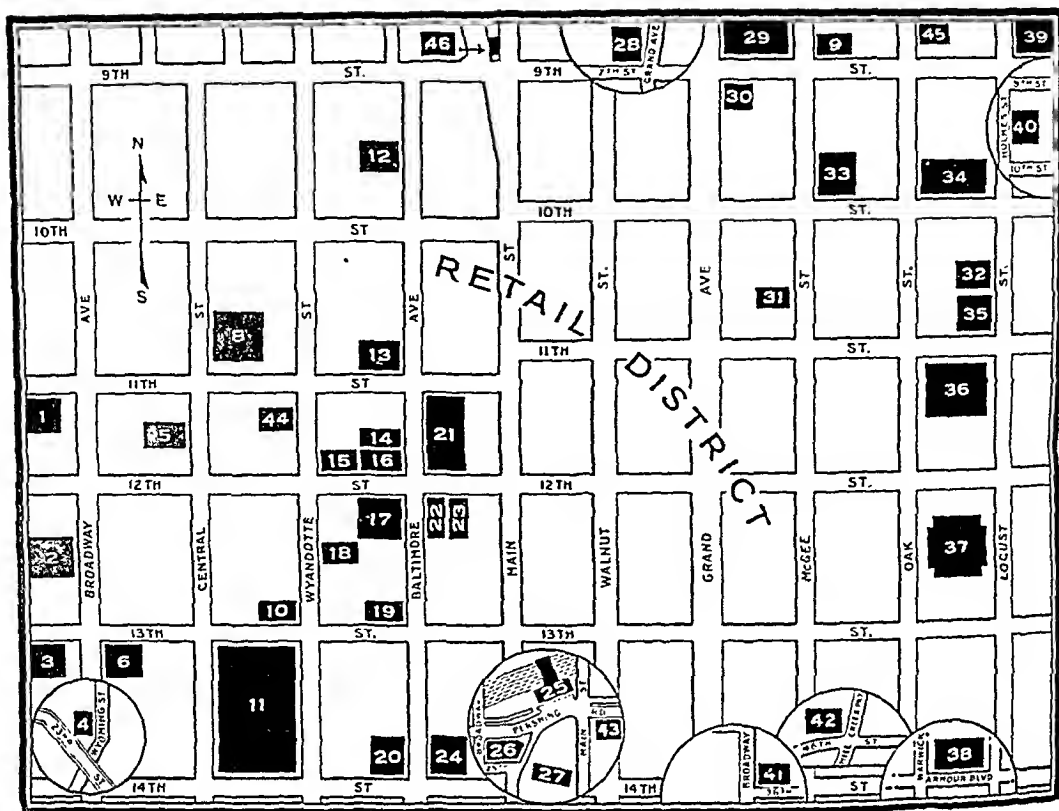
(Please attach sheet listing additional names if necessary.)

Name

Firm Name

Mailing Address

City State



HOTELS—(All Rates Quoted are for Rooms with Bath)

Map No.	Hotel	Address	Rates	
			Single	Double
18	Aladdin	1213 Wyandotte	\$2.00-\$2.50	\$3.00-\$5.00
21	Baltimore	12th and Baltimore	\$2.00-\$3.50	\$3.00-\$6.00
38	Bellerive	214 East Armour	\$2.50-\$4.00	\$4.00-\$5.00
14	Bray	1114 Baltimore	\$1.50-\$2.50	\$2.50-\$3.50
40	Chase	911 Holmes	\$1.50	\$2.50
2	Commonwealth	12th and Broadway	\$2.00-\$3.00	\$3.00-\$5.00
22	Dixon	12th and Baltimore	\$2.00-\$3.50	\$3.50-\$5.00
32	Drake	1016 Locust	\$1.50	\$2.50
41	Hyde Park	36th and Broadway	\$3.00-\$7.00	\$3.50-\$10.00
13	Kansas Citian	11th and Baltimore	\$2.50-\$4.00	\$3.50-\$7.00
17	Muehlebach	12th and Baltimore	\$3.00-\$6.00	\$4.50-\$8.00
42	Park Lane (Apartments)	4600 Mill Creek Parkway	\$3.00-\$5.00	\$4.00-\$7.00
16	Phillips	12th and Baltimore	\$2.50-\$4.00	\$4.00-\$6.00
33	Pickwick	10th and McGee	\$2.50-\$4.00	\$3.50-\$5.00
43	Plaza	13 East 24th	\$1.50-\$2.50	\$2.50-\$3.50
24	President	14th and Baltimore	\$2.50-\$5.50	\$3.50-\$8.00
44	Rasbach	1116 Wyandotte	\$1.50-\$2.50	\$2.50-\$3.50
10	Robert E. Lee	13th and Wyandotte	\$1.75-\$2.50	\$2.75-\$3.50
23	Sexton	15 West 12th	\$2.00-\$2.50	\$3.00-\$5.00
45	Snyderhof	917 Oak	\$1.50-\$2.50	\$2.00-\$4.00
15	Stats	12th and Wyandotte	\$2.00-\$3.50	\$3.00-\$6.00
9	Victoria	9th and McGee	\$1.50	\$2.00
46	Westgate	Main and Delaware at 9th	\$1.50-\$2.00	\$2.00-\$3.00

HALLS

Map No.	Hall	Address
11	Municipal Auditorium	13th to 14th, Wyandotte to Central
4	American Royal Building	23rd and Wyoming
8	Ararat Temple	11th and Central
20	Edison Hall	1330 Baltimore

PUBLIC BUILDINGS

Map No.	Building	Address
36	City Hall	414 East 12th
13	Convention Bureau, Chamber of Commerce	1028 Baltimore
37	Court House	415 East 12th
29	Federal Building	815 Grand
20	K. C. Power and Light Building	1330 Baltimore
27	Liberty Memorial	Union Station Plaza
26	Post Office	315 West Pershing Road
39	Public Library	506 East 9th
25	Union Station	30 Union Station Plaza

CLUBS

Map No.	Club	Address
5	Eagles Club	1108 Central
28	Elks Club	120 East 7th
13	Kansas City Athletic Club	11th and Baltimore
19	Kansas City Club	13th and Baltimore
12	University Club	918 Baltimore
34	Y.M.C.A.	10th and Oak
31	Y.W.C.A.	1020 McGee

CHURCHES

Map No.	Church	Address
1	Cathedral	411 West 11th
35	First Christian Church	11th and Locust
3	Grace and Holy Trinity (Episcopal)	415 West 13th
30	Grand Avenue Temple (Methodist)	9th and Grand
6	West Side Branch Baptist	1301 Broadway

ASSOCIATION NEWS

SIXTY-SEVENTH ANNUAL MEETING

Kansas City, Missouri

October 25-28, 1938

HEADQUARTERS: HOTELS MUEHLEBACH, PRESIDENT, AND KANSAS CITIAN

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Wofford E. Baldwin, M.D., St. George, S. C.,
Acting Director, Dorchester County Health
Dept.

O. H. Cheek, M.D., Dublin, Ga., County
Commissioner of Health

H. Burton Doust, M.D., 302 City Hall, Syra-
cuse, N. Y., Commissioner of Health

Harold M. Erickson, M.D., The Dalles, Ore.,
Medical Director, Wasco County Health
Unit

Alfred E. Eyres, M.D., Court House, Walla
Walla, Wash., City and County Health
Officer

William Fraden, M.D., 1634 Popham Ave.,
New York, N. Y., District Medical Super-
visor, Dept. of Health

Ben Freedman, M.D., Franklinton, La., Direc-
tor, Washington Parish Health Unit

Ralph T. Frisbee, Whitehall Rd., Amesbury,
Mass., Agent and Secretary, Board of
Health

Eugene A. Gillis, M.D., Dyersburg, Tenn.,
Director, Dyer County Health Dept.

Frank M. Hall, M.D., Athens, Ala., Lime-
stone County Health Officer

Robert H. Haralson, M.D., Box 456, Tifton,
Ga., Tift County Commissioner of Health

Eugene F. McGillian, M.D., 317 City Hall,
Yonkers, N. Y., Commissioner of Health

Chris L. Mengis, M.D., P. O. Box 547, Winns-
boro, La., Director, Franklin Parish Health
Unit

Rufus F. Payne, M.D., State Health Dept.,
Atlanta, Ga., Assistant Director, County
Health Work

Gordon E. Savage, M.D., N. West St., Xenia,
O., Greene County Health Commissioner

Herbert C. Schenck, M.D., 11 Hunter St.,
S.W., Atlanta, Ga., Director, Division of
Tuberculosis Control, State Dept. of Health

Samuel Steinholtz, M.D., 239 Snediker Ave.,
Brooklyn, N. Y., Deputy Medical Super-
intendent, Harlem Hospital

John P. Walsh, M.D., Drawer C. Greenvew,
Ill., District Health Supt., State Dept. of
Public Health

Roy H. Wilson, M.D., 207 Rencher St.,
Clovis, N. Mex., Deputy District Health
Officer

Laboratory Section

Fred J. Baker, P. O. Box 899, Douglas, Ariz.,
Sanitarian, Cochise County Health Dept.

Gail W. Dalrymple, 1806 Maple Ave.,
Evanston, Ill., Director, Division of Labs.,
Dept. of Health

Carl F. Dunker, 15 W. Glen St., Holyoke,
Mass., Junior Chemist, State Dept. of Public
Health

Arthur P. Dunnigan, Ph.D., Minn. Dept. of
Health, University Campus, Minneapolis,
Minn., Bacteriologist, Division of Prevent-
able Diseases

Harry L. Edwards, 608 S. Dearborn St.,
Chicago, Ill., Pure Milk Assoc.

Margaret L. Flanagan, 420 Sixth Ave. N.,
Nashville, Tenn., Technician, State Dept.
of Public Health

Frances I. Friewer, Diagnostic Lab., P. O. Box 1,
Health, Springfield, Ill., Junior Bact' Division

Harriet M. Goodman, 16 Seaman Drive, Los

Brunswick, N. J., Bacteriologist, E. R. Squibb & Sons
 Glen H. McLaughlin, 303 E. 9th. Austin, Tex., Water Analyst, State Dept. of Health
 Juan A. Montoya O., M.D., 615 N. Wolfe St., Baltimore, Md., Student
 Carolyn Oldenbusch, 72 Marlborough Rd., Brooklyn, N. Y., Bacteriologist, Dept. of Health
 Andrew J. Pensa, 15 Gelston Ave., Brooklyn, N. Y., Chemist, Dept. of Health
 Ralph H. Tanimoto, 2110-A Date St., Honolulu, T. H., Laboratory Technician, Board of Health
 Joseph C. Wenger, 1801 S. LaCienega, Los Angeles, Calif., Laboratory Technician, Adohr Milk Farms

Vital Statistics Section

Jean C. Bowman, International House, Berkeley, Calif., Student
 Louis Feldman, Opelika, Ala., Statistical Clerk, State Dept. of Health
 Clifford L. Harlan, Rm. 203, City Hall, Peoria, Ill., Statistician, Health Dept.
 Frank S. Morrison, 1665 S. Lincoln St., Denver, Colo., Director, Division of Vital Statistics, State Dept. of Health

Public Health Engineering Section

Inga M. K. Allison, 120 Garfield St., Fort Collins, Colo., Dean, Division of Home Economics, Colorado State College
 Wade H. Bolton, Silver City, N. Mex., District Sanitarian
 John M. David, Statesboro, Ga., Sanitary Engineer, Bulloch County Health Dept.
 Robert A. Dean, Box 354, McRae, Ga., District Sanitarian, Telfair-Wheeler Health Dept.
 Lewis W. de Jarnette, 120 Clairmont Ave., Decatur, Ga., Sanitarian, DeKalb County Board of Health
 Wendell J. Erickson, Loudon Lane, Loudonville, N. Y., Assistant Sanitary Engineer, State Dept. of Health
 Arthur W. Ferguson, 483 Orange St., Macon, Ga., Sanitarian, Bibb and Jones County Health Depts.
 Adolph G. Franksen, 1806 Maple Ave., Evanston, Ill., City Food and Dairy Inspector
 Gilbert R. Frith, 1425 McPherson Ave., S.E., Atlanta, Ga., Assistant Engineer, State Board of Health
 Lawrence B. Hall, C.P.H., P. O. Box 103, Swainsboro, Ga., Assistant Engineer, State Board of Health
 Eugene C. Harrison, 416 W. Poplar St., Griffin, Ga., County Sanitarian, Spalding County Health Dept.

Carl E. Henderson, 110 W. Shaw, Carlsbad, N. Mex., District Sanitarian
 Patrick L. Hughes, 423 Williams, Waycross, Ga., Assistant Division Engineer, State Health Dept.
 Erich W. Kearney, P. O. Box 34, Morganton, N. C., Assistant Engineer, State Board of Health
 Breadon W. Kellogg, 1578 Florence Ave., Evanston, Ill., City Sealer
 William A. Legwen, 501 Greene, Augusta, Ga., Sanitary Engineer, Richmond County Health Dept.
 Richard E. Lindsay, 1024 Noyes St., Evanston, Ill., Housing and Sanitation Inspector, Board of Health
 Charles W. Matheny, Jr., Laurens County Health Dept., Dublin, Ga., County Sanitarian
 James H. Menefee, 814 Monroe St., Jefferson City, Mo., Sanitary Engineer, State Board of Health
 James N. Newman, 65 E. Spring St., Gainesville, Ga., Sanitarian, Hall County Health Dept.
 Walter P. Rial, Shanghai Waterworks Co., Ltd., Shanghai, China, Engineer-in-chief
 L. Glen Shields, 555 Clinton, Detroit, Mich., Associate Sanitary Engineer, City Dept. of Building
 Elmer C. Slagle, Rm. 115, Court House, Duluth, Minn., Public Health Engineer, District #4, Minnesota Dept. of Health
 Henry B. Starr, Jr., 6 Hardeman Bldg., Macon, Ga., Assistant Engineer, State Dept. of Health
 Clarence J. Velz, 327 North Ave., Fanwood, N. J., Senior Engineer, Region #1, FPWA
 John E. Waaser, 488 Fairbanks Ave., Oakland, Calif., Student—Sanitarian
 C. H. Watson, 1228 E. Center, Pocatello, Idaho, Sanitarian, State Dept. of Public Welfare
 Dudley M. Williams, Box 1482, Santa Fe, N. Mex., Student at present at Univ. of Calif.
 Myron J. Woodman, 1123 Noyes St., Evanston, Ill., City Food and Dairy Inspector
 Hallock W. Woodworth, D.D.S., 816 Oregon Bldg., Portland, Ore., Assistant State Director, Community Sanitation, U. S. Public Health Service

Industrial Hygiene Section

William R. Bradley, 1151 Taylor Ave., Detroit, Mich., Junior Sanitary Engineering Aid, Dept. of Health
 Frank N. Chirico, 210 Commonwealth Bldg., Harrisburg, Pa., Chemical Engineer, Division of Industrial Hygiene, State Dept. of Health

Allan E. Dooley, 210 Commonwealth Bldg., Harrisburg, Pa., Senior Chemist, Division of Industrial Hygiene, State Dept. of Health
 Nathan Gales, 2492 DeVoe Terrace, New York, N. Y., Chemist, Dept. of Health
 Walter D. Higgins, M.D., 6 Park St., Peabody, Mass., Industrial Surgeon
 Julia L. Matthews, Ph.D., 210 Commonwealth Bldg., Harrisburg, Pa., Senior Chemist, Division of Industrial Hygiene, State Dept. of Health

Food and Nutrition Section

Frances B. Bowen, St. Luke's and Children's Hospital, Philadelphia, Pa., Dietitian
 Willard H. Boynton, 310 Cedar, New Haven, Conn., Student
 Elmer E. Harter, Jr., Dept. of Agriculture, Harrisburg, Pa., Director, Bureau of Foods and Chemistry
 Morris B. Jacobs, Ph.D., 355 Bradford St., Brooklyn, N. Y., Chemist, Dept. of Health
 Cecilia Schuck, Ph.D., Purdue University, W. Lafayette, Ind., Instructor in Nutrition

Child Hygiene Section

Hugh J. Bickerstaff, M.D., State Dept. of Health, Atlanta, Ga., Assistant Director, Child Hygiene
 Lela Ewert, 510 W. Palm Lane, Phoenix, Ariz., Physical Therapy Technician, Crippled Children's Division, State Board of Social Security and Welfare

Public Health Education Section

Delmar I. Allman, Dr.P.H., 136 N. 9th St., Corvallis, Ore., Associate Professor of Hygiene and Physical Education, Oregon State College
 Doris G. Chandler, C.P.H., 171 Haili St., Hilo, T. H., Executive Secretary, Tuberculosis Society of Hawaii
 Charles M. Cree, State Dept. of Public Health, Santa Fe, N. Mex., Director, Health Education
 Kate Frankenthal, M.D., State Farm for Women, Niantic, Conn., Psychiatrist
 Sophie Ginsberg, C.P.H., 354 Beacon St., Boston, Mass., Health Education Secretary, Cambridge Tuberculosis and Health Assoc.
 Mary P. Harley, State Dept. of Health, Atlanta, Ga., Associate Director, Division of Dental Health Education
 George J. Holmes, M.D., 31 Green St., Newark, N. J., Director, Dept. of Health Education and Service, Board of Education
 Anne M. Newman, 1745 President St., Brooklyn, N. Y., Teacher of Public Health, Brooklyn College
 Ida Olin, 130 S. American St., Stockton, Calif.,

Mental Hygiene Supervisor, San Joaquin County Schools
 Marguerite G. Wulfers, 920 Riverside Drive, New York, N. Y., Teaching Hygiene, City College of New York

Public Health Nursing Section

Madeline F. Buck, P. O. Box 1436, Greeley, Colo., Senior County Nurse, Weld County Nursing Service
 Marguerite E. Butler, R.N., Box 1004, Ely, Nev., Maternal and Child Health Staff Nurse, State Dept. of Health
 Maud W. Fleming, R.N., Box 144, Milledgeville, Ga., District Advisory Nurse, State Dept. of Health
 Mila A. Frantz, 927 N. Magnolia Blvd., Burbank, Calif., School Nurse Inspector, Board of Education
 Ruth A. Huddleston, 787 Garfield St., Denver, Colo., Field Supervisor, State Division of Public Health Nursing
 Mildred E. Jepson, R.N., 2554 Prairie Ave., Evanston, Ill., Assistant Nurse, Social Hygiene Clinic, Dept. of Health
 Genelle C. Keithly, 1511 Bellevue, Richmond Heights, Mo., Staff Nurse, St. Louis County Health Dept.
 Marjorie A. Leigh, 722 Clark St., Evanston, Ill., Public Health Nurse, Dept. of Health
 Altha A. Lyman, 723 Simpson St., Evanston, Ill., Supervision of Communicable Disease Cases, Health Dept.
 Catherine M. Matchen, 1426 Dempster St., Evanston, Ill., Nurse, Charge of Social Hygiene Clinic, Dept. of Health
 Grace M. Phillips, R.N., Box 44, Williams, Ariz., Staff Nurse, Coconino County Health Dept.
 Ruth E. Phillips, 436 State Office Bldg., Denver, Colo., Director, Division of Public Health Nursing, State Division of Public Health
 Valeria Shell, P. O. Box 12, Douglas, Ga., Coffee County Nurse

Epidemiology Section

Paul W. Auston, M.D., Lee County Health Dept., Opelika, Ala., Tuberculosis Clinician, East Alabama Health District
 Frederick G. Gunlaugson, Minn. Dept. of Health, Minneapolis, Minn., Epidemiologist
 James C. Hart, M.D., 820 Elm St., New Haven, Conn., Assistant Epidemiologist, Dept. of Health

Unaffiliated

Ernest A. Branch, D.D.S., State Board of Health, Raleigh, N. C., Director, Division of Oral Hygiene
 John S. Cruzan, 1870 Oak Tree Drive, Los

Angeles, Calif., Inspector, State Dept. of Public Health

Howard M. Kalodner, V.M.D., Box 327, Harrisburg, Pa., Director, Bureau of Animal Industry

Charles Kurtzhalz, 311 S. Juniper St., Philadelphia, Pa., Director, Philadelphia Health Council and Tuberculosis Committee

Charles O. Plumb, County Court House, Greeley, Colo., Chairman, Weld County Board of Health

John J. Prendergast, M.D., Chrysler Corporation, Detroit, Mich., Medical Director

John O. Raffety, M.D., 5763 Merriewood Drive, Oakland, Calif., Health Officer Trainee

Arthur J. Rivard, 203 White St., Hartford, Conn., Narcotic Agent, State Dept. of Health

Earl P. Slone, 104 W. Chestnut St., Louisville, Ky., Professor of Botany and Bacteriology, Louisville College of Pharmacy

SKIN IRRITANTS REPORT AVAILABLE

HENRY Field Smyth, M.D., Dr.P.H., of the University of Pennsylvania, Philadelphia, Pa., has prepared a report representing a combination of the last three Skin Irritants reports presented to the Industrial Hygiene Section, A.P.H.A., and covering a 9 year period from 1926 to 1934, completely indexed by author and subject.

The U. S. Public Health Service has had these reports mimeographed, comprising 211 pages, and a limited number of copies are available.

Those interested may obtain copies by writing to J. J. Bloomfield, P. A. Sanitary Engineer, National Institute

of Health, U. S. Public Health Service, Washington, D. C.

PUBLICATIONS NEEDED

THE Association stock of these issues of the *Journal* is almost depleted:

January, 1937

February, 1937

July, 1937

January, 1938

If any members can spare copies of these numbers, the Executive Office will much appreciate it if they will kindly send them to headquarters, at 50 West 50th Street, New York, N. Y.

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS WANTED

HEALTH OFFICERS

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins, and 14 years public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, M.D., University of Cincinnati: with postgraduate training in venereal disease control, Johns Hopkins; now employed. is available for venereal disease control officer. A363

Physician, M.D., Johns Hopkins; public health course at Michigan; experienced in school and city health work, will consider an administrative post in eastern United States. A354

Physician, M.D., Northwestern University; Dr.P.H., Yale; will consider appointment in general administration, infant welfare or epidemiology. A300

Physician, M.D., Tufts; C.P.H., Johns Hopkins; administrative experience large city health department, will consider position as health officer or epidemiologist. A362

Physician, M.D., C.P.H.; 2 years' experience as district health officer, anxious to do venereal disease control work or epidemiology. A345

CHILD HYGIENE

Experienced physician, M.D. and Ph.D., University of Minnesota, specially qualified in maternal and child hygiene, directing state and local programs; will consider position of better sort. A238

HEALTH EDUCATION

Young woman, Ph.D., Yale University, experienced in the field of bacteriology and immunology, will consider position in health organization or education. M324

Young man, at present college teacher of hygiene and physical education and experienced in university medical services, desires position as executive in public or private health organization. M357

LABORATORY

Young man, A.B. in Chemistry, Phillips University; M.S. in Public Health Laboratory Work, University of Michigan; desires position in state or city health department laboratory. L304

Young woman, M.S., University of Michigan, experienced in biochemistry, bacteriology, water analysis and blood work, will consider research position. L322

Man, with Bachelor of Bacteriology degree, medical courses at University of Maryland for 4 years, seeks position as bacteriologist with investigation work, as laboratory director or as instructor in public health. L281

MISCELLANEOUS

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. M352

Young man, Sc.D., Johns Hopkins; experience in public health and research bacteriology; will consider position in public health or university teaching. L312

Graduate Sanitary Engineer with service under U.S.P.H.S. and State Departments of Health, specially interested in filtration plant design and operation and shellfish sanitation, seeks employment. E356

Young man, M.S.P.H., Michigan; B.S., Muskingum College; desires position in county unit or as sanitarian for city. Seven years' teaching experience. Interested in case work. M364

NEWS FROM THE FIELD

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

While the following list does not show all universities and technical schools offering summer courses in public health, it represents those who have replied to a questionnaire sent out by the American Public Health Association.

American National Red Cross

Courses in Teacher Training for Home Hygiene Instruction:

- University of California, Los Angeles, Calif.—June 25–August 5
- Colorado State College, Fort Collins, Colo.—July 9–August 19
- Peabody College, Nashville, Tenn.—June 6–July 13
- University of Pennsylvania, Philadelphia, Pa.—June 27–August 9

The National Society for the Prevention of Blindness, Inc., New York, N. Y.

Sight-saving classes:

- State Teachers College, Buffalo, N. Y.—July 5–August 12
- Teachers' College, Columbia University, New York, N. Y.—July 6–August 13
- Tulane University, New Orleans, La.—June 13–July 23
- University of Cincinnati, Cincinnati, Ohio—June 20–July 26
- University of Hawaii, Honolulu, T. H.—June 27–August 5
- University of Washington, Seattle, Wash.—June 20–July 20
- Wayne University, Detroit, Mich.—June 27–August 5

University of California, Berkeley, Calif.

June 27–August 5

- General Bacteriology
- Child Development
- Physiology of the Growth and Development of Children
- Administration of the School Health Program

- Principles of Health Teaching for Nurses
- Administration and Organization of Public Health Nursing
- Principles and Practice in Public Health Nursing
- Introduction to Educational Psychology
- General Psychology
- Elementary Epidemiology *
- Elementary Public Health *
- Public Health Administration *
- Communicable Diseases *

* These four courses are offered in the Inter-session, May 16–June 24

University of California at Los Angeles, Los Angeles, Calif.

June 27–August 5

- Elementary Bacteriology
- Growth and Development of the Child
- Adolescence
- Mental Hygiene
- Administration of the School Health Program
- Principles of Teaching as Applied to Home Hygiene Courses
- Methods in Teaching Home Hygiene Courses with Practice Teaching
- Essentials of Nutrition
- General Psychology
- Educational Psychology
- Public Health and Preventive Medicine
- Principles and Practice of Public Health Nursing
- Social Case Work as Related to Public Health Nursing
- General Zoölogy
- Social Pathology

The Catholic University of America, Washington, D. C.

June 24–August 8

- Child Study

Nursing Education
Public Health Nursing
Social Work
Sociology

Columbia University

DeLamar Institute of Public Health,
College of Physicians and Surgeons, 630 West 168th Street,
New York, N. Y.

June 14--July 2

School Health Supervision--Medical Inspection, Mental Hygiene, and Physical Education

(These courses will not be given unless ten candidates have signified their intention to register before May 1)

Teachers College, Columbia University,
New York, N. Y.

July 6--August 13

Organization of Health Education in Public Schools, Colleges, and Universities:
Principles, Methods, and Materials

Child Hygiene

Health Education

Health and Physical Education

Health Care of Children

Home and Community Hygiene

Nutrition and Health

Personal and General Hygiene

Public Health Nursing

Public Health Administration

Safety Education Materials and Methods

School Hygiene

School Nursing

Education of the Handicapped:

Demonstration Classes

Observation, Practice Teaching, and Clinical Work

Survey of Ear, Orthopedic, Cardiac, and Certain Tuberculous Conditions, and of Certain Types of Malnutrition

Education of the Blind and Partially Seeing (beginning and advanced courses)

Education of the Deaf (advanced courses only), and of the Hard of Hearing

Education of the Crippled and Other Motor Handicapped

Education of the Mentally Handicapped

Education of the Socially Handicapped

Speech Correction

Psychology of the Mentally Handicapped

Psychology of the Physically Handicapped

June 6--July 1

Curriculum in Health Education

Field Work in Health Education

Health Service in Schools

Cornell University, Ithaca, N. Y.

July 5--August 13

Health Education:

The School Health Program

Mental and Physical Health Problems of the School Child

Physical Education:

Gymnastics

University of Denver, Denver, Colo.

June 20--August 26

Conference on Health and Physical Education

Methods of Health Education

Leadership and Planning of Community Recreation

Duke University, Durham, N. C.

June 13--July 23

Materials and Methods in Health Education

Mental Hygiene of the School Child

Personal and School Hygiene

Harvard University--Medical School, Boston, Mass.

June 20--August 6

Physiotherapy

The University of Hawaii, Honolulu, Hawaii

June 27--August 5

Conservation of Sight

Physical and Health Education in the Primary Grades

Physical and Health Education in the Upper Elementary Grades

State University of Iowa, Iowa City, Iowa

June 13--August 5

Hygiene

Nursing

Nutrition

Physical Education

University of Illinois, Urbana, Ill.

June 20--August 13

Entomology:

How Insects Live and Their Importance to Mankind

Home Economics:

Nutrition

Dietetics

Foods

Organization and Management of the Home

The Child and His Development

Physical Education for Men:

Physical Education

Training and First Aid

Problems in Physical Education

Problems in School Health

Physical Education for Women:

Physical Education

Community Recreation

Physical Education Program for the High School including First Aid

Community Recreation

Principles of Body Movement

University of Kentucky, Lexington, Ky.

June 13–August 6

Public Health Nursing

Public Health

Elementary Psychology

Maternal and Child Health

County Health Practice

Deficiency Diseases and Nutrition

Social Work Information

Nutrition and Public Health

School and Community Health

Care and Treatment of Crippled Children

Mental Hygiene

Bacteriology

Zoölogy

Sanitation

Practical Sanitation

Communicable Diseases

Hygiene for Teachers

Health Supervision of Schools

Vital Statistics

Biostatistics

*Massachusetts Institute of Technology,
Cambridge, Mass.*

June 13–July 22

Bacteriology

Public Health Bacteriological Methods

June 13–July 1

Food Technology

June 27–August 5

Modern Biology

*Massachusetts State Teachers College,
Hyannis, Cape Cod, Mass.*

(Sponsored by the Division of Child Hygiene of the Massachusetts Department of Public Health, in coöperation with the State Department of Education)

July and August

Source Materials for the Development of a School Health Program

Methods of Teaching Health in the Secondary Schools

*Michigan State College, East Lansing,
Mich.*

June 20–July 29

General Bacteriology

Medical Biology Courses

Pathological Bacteriology

Personal Hygiene

Sanitary Science

Physical Education Departments offer the following courses:

School Health Problems

First Aid

*University of Michigan, Ann Arbor,
Mich.*

June 27–August 6

Child Hygiene

Principles of Public Health Nursing

Administration and Organization of Public Health Nursing

Public Health Law and Administration

*University of Minnesota, Minneapolis,
Minn.*First Term, June 13–July 22:
Second Term, July 25–August 26*Public Health Nursing Courses**First Term:*

Elements of Preventive Medicine

Maternal and Child Hygiene (for public health nurses only)

Health of the School Child

Tuberculosis and Its Control

Principles and Special Fields of Public Health Nursing

Supervision in Public Health Nursing

School Nursing

Field Practice with Family Health Agency

Public Health Administration and
Field Work
Nursing and Social Problems in the
Control of Gonorrhea and Syphilis
Advanced Problems in Public Health
Nursing

Courses in Biometry:

Biometric Principles
Topics in Biometry

Second Term:

Field Practice with Family Health
Agency

New York University, Washington
Square, New York, N. Y.

July 6–August 12

Child Hygiene
Methods of Teaching for Health
Advanced First Aid—Materials and Methods
The Administration of Public Health
Organization of School Nursing
Supervision in Public Health Nursing
Principles of Public Health Nursing
The Teaching Activities of the Public
Health Nurse
Advanced Physical Inspection
Interpretation of Public Health Materials I
Applied Nutrition for Health Supervisors
Administration of Clinic Service
Social Agencies and Their Relation to the
Public Health Nursing Program
Principles and Methods of Teaching in
Nursing Education
Home and Community Problems Caused by
Tuberculosis
Introduction to Social Case Work
Social Case Work in the Schools

New York University, New York, N. Y.

July 5–August 12

Course of six weeks, preparing for
reconstruction work with the physically
handicapped.

Summer course, to be given at New
York University Camp, Sloatsburg, N.
Y., under the auspices of New York
University, Summer Session of the
School of Education.

Information can be secured from Dr.
Walter J. Craig, Director of the Divi-
sion of Orthopedics, New York State
Department of Health, and from New
York University, New York, N. Y.

Rutgers University, New Brunswick,
N. J.

July 5–August 12

Public Health Practice
Principles of Public Hygiene

Smith College—School for Social Work,
Northampton, Mass.

July 6–August 31

Health and Disease
Child Development and Hygiene
Social Aspects of Medicine

Stanford University, Stanford Univer-
sity, Calif.

June 23–September 3

Physical Education and Hygiene

Syracuse University, Syracuse, N. Y.

July 5–August 13

Principles of Public Health Nursing
Maternity and Child Hygiene
Special Fields in Public Health Nursing
Preventable Diseases
Case Studies in Public Health Nursing
Psychology (Child, Adolescent, General)
Nutrition
Methods and Materials in Health Educa-
tion

Temple University, Philadelphia, Pa.
Teachers College—Department
of Physical and Health Educa-
tion

June–July

Supervision of Health Instruction

Wagner College, Staten Island, N. Y.

July 5–August 12

Bacteriology
Applied Bacteriology
Serology
Clinical Pathology
Seminar in Medical Technology

Washington University, St. Louis, Mo.

June 17–July 29

Education
Natural Sciences
Psychology
Sociology and Social Work

University of Washington, Seattle, Wash.

June 20–July 20 (First Term)

July 21–August 19 (Second Term)

Diagnostic and Remedial Work in Education

Behavior as an Expression of Health

Nutrition

Bacteriology

Organization, Administration, and Techniques in Special Fields of Public Health Nursing

Public Health Administration and Epidemiology

Rural Public Health Nursing

Health Service in Schools

Posture Teaching Program

Principles of Health Education

Methods and Materials in Health Teaching

Wayne University, Detroit, Mich.

June 21–August 14

Psychology

Sociology

University of West Virginia, Morgantown, W. Va.

June 8–August 25

History of Physical Education

Problems in Health and Physical Education

Tests in Health and Physical Education

American Red Cross First Aid

Advanced Public School Health Seminar in Health and Physical Education

Western Reserve University—School of Applied Social Sciences, Cleveland, Ohio

June 20–July 29

Public Health Nursing:

Principles of Public Health

Principles of Health Teaching

University of Wisconsin, Madison, Wis.

June 27–August 5

Curriculum in Physical Education for

Junior and Senior High School Girls

Effects of Physical Activity on the Body

(Physiology of Exercise)

First Aid and Safety Education

Health Education in Schools

Human Anatomy

Medical Bacteriology

Nature, Function and Organization of Play

Physical Examinations

Physical Examinations and Therapeutics

Play, Recreation and Leisure Time Problems

Physical Therapy

Recent Advances in Applied Physiology

School Health and Hygiene

Tests and Measurements in Physical Education

Therapeutic Gymnastics

SYPHILIS COURSES

ONE DAY institutes on syphilis for practising physicians will be held by the Medical Society of the State of New York in coöperation with the State Department of Health.

The courses will include instruction in the pathology, etiology, diagnosis, and treatment of syphilis, and the organization and administration of syphilis control programs will be outlined. These institutes will be conducted in the following cities:

Albany—May 26–27

Binghamton—May 24–25

Jamestown—May 23

New York—May 23–24

Syracuse—May 18–19

Watertown—May 20

Physicians wishing to attend any of these institutes should file applications with the District State Health Officer, or: Thomas P. Farmer, M.D., New York State Medical Society, 608 East Genesee Street, Syracuse, N. Y.

BIRTH REGISTRATION CIRCULAR

A CIRCULAR entitled "What Happens When Birth Registration Goes Amiss" has been issued by the Maryland State Department of Health, Baltimore. It is being sent to all physicians, midwives, and public health nurses in Maryland.

NATIONAL HEALTH CONFERENCE

MISS Josephine Roche, Chairman of the President's Interdepartmental Committee to Coördinate Health and Welfare Activities, recently announced that development of a national health program will be studied at a forthcoming public conference to be held in Washington.

She said the conference had been arranged at the suggestion of President Roosevelt. In a letter to her, he suggested:

"... that your committee give consideration to the desirability of inviting at some appropriate time representatives of the interested public and of the medical and other professions to examine the health problems in all their major aspects, and to discuss ways and means for dealing with these problems."

Invitations, it was said, would be sent to representatives of the medical and other professions and many other groups.

DEATH CERTIFICATES FOR NEW YORK

NEW death certificate forms are being prepared, Health Commissioner John L. Rice, of New York, N. Y., has announced.

These forms have a separate section devoted entirely to causes of death, which information is to be kept strictly confidential and may not be used in court cases.

The Queens County Medical Society and other county medical groups aided in drawing up these forms, which are expected to lead to more honest reporting on deaths.

CHICAGO TUMOR INSTITUTE

THE Chicago Tumor Institute was opened March 21.

It offers consultation service to physicians in the diagnosis and treatment of cancer and radiation facilities for cancer patients.

The Institute also proposes to conduct research and to offer training to physicians who may wish to qualify as

specialists in the study and treatment of this disease.

WESTERN BRANCH A.P.H.A.

THE Ninth Annual Meeting of the Western Branch American Public Health Association will be held in Portland, Ore., June 6-8, with headquarters in the Hotel Multnomah.

There will be papers on public health administration, a symposium on syphilis, a panel discussion on public health nursing functions, papers on high school and college hygiene, a discussion on plague, and papers on public health laboratory procedures. Concurrently with the Western Branch meeting will be the Annual Conference of State Supervisory Nurses, the Annual Conference of the City and County Health Officers of Oregon, the Annual Meeting of the Washington State Public Health Association, the Annual Meeting of the Oregon Nutrition Council, and the Conference of the Pacific Coast Branch of State Registration Executives.

There will be visits to various points of interest within the city and an excursion to Multnomah Falls and Bonneville Dam. The program committee expects the meeting to be the most successful yet held in the history of the Western Branch, both from the standpoint of scientific material to be presented and the entertainment to be given the delegates and guests.

CONFERENCE OF STATE AND PROVINCIAL
HEALTH AUTHORITIES ELECTS
NEW OFFICERS

AT the annual session of the Conference of State and Provincial Health Authorities of North America, held in Washington in April, the following officers were elected:

President—Felix J. Underwood, M.D., Executive Officer, State Board of Health, Jackson, Miss.

Vice-President—John T. Phair, M.B.,

C.P.H., Chief Medical Officer of Health, Provincial Department of Health, Toronto, Ont.

Secretary-Treasurer—A. J. Chesley, M.D., State Health Officer, St. Paul, Minn.

HEALTH OFFICERS HONORED

THE State and Provincial Health Authorities of North America, on April 10, honored Health Officers from the United States and Canada who had served for 25 years or longer. Among present and former members of the conference honored were the following:

Cornelius A. Harper, M.D.
Thomas R. Crowder, M.D.
Henry E. Young, M.D.
James A. Hayne, M.D.
Frederick E. Trotter, M.D.
Theodore B. Beatty, M.D.
Arthur T. McCormack, M.D.
Charles F. Dalton, M.D.
William F. Cogswell, M.D.
John A. Ferrell, M.D., Dr.P.H.

KANSAS COUNTY HEALTH OFFICERS

ANNOUNCEMENT has been made of recently appointed county health officers in the State of Kansas. They are:

Edwin R. Hill, Jr., M.D.—Lyons, Rice County
August A. Meyer, M.D.—Alma, Wabaunsee County
Orlin P. Wood, M.D.—Marysville, Marshall County
Alfred J. Horejsi, M.D.—Ellsworth, Ellsworth County
Benjamin Brunner, M.D.—Wamego, Pottawatomie County
Raymond W. Moore, M.D.—Eureka, Greenwood County
Frank A. Trump, M.D.—Ottawa, Franklin County
Franklin R. Croson, M.D.—Clay Center, Clay County
Benjamin L. Phillips, M.D.—Paola, Miami County
Leon W. Zimmerman, M.D.—Liberal, Seward County
Ivan B. Parker, M.D.—Hill City, Graham County

Reappointment has also been announced of the following county health officers:

Spencer B. Dykes, M.D.—Esbon, Jewell County

Robert J. Lanning, M.D.—Junction City, Geary County

Donald A. Bitzer, M.D.—Washington, Washington County

WISCONSIN APPOINTMENTS

THREE new officers were recently elected to the Wisconsin State Board of Health. They are:

President—Dr. John J. Seelman, of Milwaukee

President-elect—Dr. William W. Kelly, of Green Bay

Vice-President—Dr. Joseph Dean, of Madison

FRENCH INSTITUTE FOR THE PREVENTION OF OCCUPATIONAL DISEASES

IN December, 1937, the Minister of Labour established the Institute for the Study and Prevention of Occupational Diseases, in Paris.

This Institute, the first of its kind in France, includes not only a modern, well equipped examination room, but also a laboratory permitting extensive chemical and toxicological research and a special photographic laboratory.

A library offers to its readers literature, bibliographies, and all specialized publications in French, English, Dutch, German, and Russian, as well as the publications of the International Labour Bureau. A complete catalogue classifies, under the various headings, all the published articles dealing with the subject of occupational pathology and hygiene.

The Institute, directed by Dr. G. Hausser, includes on its scientific board such well known French scientists as Professors Balthazard, Tiffeneau, Duvoir, Etienne-Martin, Fabre, Kohn-abrest, Laugier, Godard, and Mazel.

A publication appearing every two months, *Archives des Maladies Professionnelles D'Hygiene et de Toxicologie Industrielles*, will include extensive

scientific tracts and a complete bibliographical section.

MICHIGAN BLOOD TESTS

PREMARITAL blood tests in the State of Michigan disclose an average of 45 cases of syphilis a month among applicants for license to wed, according to a report by State Health Commissioner Don W. Gudakunst.

CHANGES IN CALIFORNIA

THE City of India, Calif., has transferred its public health administration to the Riverside County Health Department. The Santa Cruz County Health Department is now administering the public health affairs of the City of Santa Cruz.

ILLINOIS TO STANDARDIZE LABORATORY PROCEDURES

THE Illinois State Department of Health has appointed a special committee to standardize diagnostic laboratory procedures. The list of committee members includes the following names:

Dr. Lewis R. Hill, Assistant Professor of Bacteriology and Preventive Medicine, Loyola University College of Medicine, Chicago

Dr. John L. White, Chief, Bureau of Laboratories, Board of Health, Chicago

Dr. Lloyd Arnold, Professor of Public Health, University of Illinois College of Medicine, Chicago

Dr. Reuben Kahn, Director of Laboratory, University Hospital, University of Michigan, Ann Arbor

LOUISIANA OYSTER RULING

THE Louisiana State Board of Health has ordered that all shipments of shell oysters without identification tags be discontinued. This is in accordance with a recently revised federal law. Dealers will supply these tags to the oyster fishermen and thus facilitate the tracing of oysters to the bedding grounds should any illness result from their use.

NORTH CAROLINA PNEUMONIA COMMISSION

APNEUMONIA commission has been established by the North Carolina State Board of Health in coöperation with the Medical Society of North Carolina and Duke University School of Medicine. This commission is under the chairmanship of Dr. Hubert B. Haywood, of Raleigh.

VETERINARIANS TOUR

THE official European tour of the American Veterinary Medical Association, to attend the Thirteenth International Veterinary Congress, to be held in Zurich and Interlaken, Switzerland, August 20-27, 1938, has been announced. The sailing date is July 13, return September 15.

A comprehensive itinerary, of general and professional interest, has been planned. Preparations have been made to receive the delegation at various institutions of importance. Dr. Adolph Eichhorn, of Pearl River, N. Y., will be in charge of the professional program, as previously.

Rates and other information will be furnished by Treasure Tours, Inc., 70 West 40th Street, New York.

DEATH

DR. BERTHA KAPLAN SPECTOR,† research associate in medicine at the University of Chicago, Chicago, Ill., died March 26. She was known for her work in amebic dysentery.

PERSONALS

Central States

ROBERT H. BELL, M.D.† Health Officer of Carlinville, Ill., has been appointed full-time Superintendent of the District Health Unit composed of the Counties of Scott, Morgan, Greene, Calhoun, Jersey, and Macoupin.

JOSEPH BLICKENSERFER, M.D.,*

* Fellow A.P.H.A.

† Member A.P.H.A.

Health Officer of New Philadelphia, Ohio, was honored with a testimonial dinner by the Tuscarawas County Medical Society, January 14, celebrating his completion of 50 years of practice.

DR. REUBEN J. HARRINGTON, of Muskegon, Mich., has been appointed Health Officer of Muskegon County.

THURMAN B. RICE, M.D.,† Professor of Bacteriology and Public Health at Indiana University School of Medicine, has been made Chairman of the University's newly formed Department of Bacteriology and Public Health; and DR. FRANK FORRY, Professor of Pathology, has been appointed Chairman of the new Department of Pathology.

Eastern States

EARLE G. BROWN, M.D.,* former State Health Officer of Kansas and recently Director of Health and Welfare in Arlington County, Va., has been appointed Commissioner of a newly established health unit in Nassau County, New York, N. Y.

DR. JOHN L. LAIRD has been appointed Chief of the Division of Laboratories in the Philadelphia (Pa.) City Department of Health.

FREDERICK W. NORDSIEK, S.B.,† has become associated with the Department of Nutrition of the American Institute of Baking, New York, N. Y. For the present, he is continuing as Secretary of the New York Diabetes Association.

BOSSE B. RANDLE,† of New York, has been appointed Director of Public Health Nursing in the new Nassau County Department of Health, Mineola, L. I. Miss Randle has recently been on the staff of the New York State Department of Health and Teachers College, Columbia University.

* Fellow A.P.H.A.

† Member A.P.H.A.

DR. EVELYN F. H. ROGERS, of Bedford Hills, N. Y., has been appointed Epidemiologist-in-training in the New York State Department of Health, and after a year's study will be assigned to the Division of Maternity, Infancy and Child Hygiene.

DR. ABEL WOLMAN, Chief Engineer, Maryland State Department of Health, Baltimore, Md., and President-elect of the American Public Health Association, will speak on the subject "Benjamin Franklin, Printer and Businessman," at the Dedication Program of the Franklin Institute, Philadelphia, Pa., on May 21.

Southern States

WOFFORD E. BALDWIN, M.D.,† formerly of Due West, S. C., has been appointed Health Officer of Dorchester County.

DR. FRANK M. ROGERS, formerly of Coleman, Ga., has been appointed Health Officer of Crittenden County, Ky., with headquarters at Marion, Ky.

DR. ELMER K. UMBERGER, formerly of Trinity, Tex., has been appointed Health Officer of McCreary County, Ky.

Western States

DR. JAMES EDDY ARNOLD, of Miles City, Mont., has been appointed Village Health Officer, and School Physician for Mountain Iron, Minn.

DR. MARGARET E. HATFIELD, of Janesville, Wis., has been appointed Health Director of Rock County, as part of an enlarged health program made possible by a federal grant. Dr. Hatfield has been serving part time in this position.

EDYTHE HERSHEY, M.D.,† has become Director of the Division of Child Welfare of the Montana State Board of Health, Helena. Dr. Hershey has for some months been associated with

the Children's Bureau, Department of Labor, Washington.

DR. LYNN J. LULL, formerly in private practice in Olathe, has been appointed Health Officer of the first full-time county health unit in Colorado recently opened in Otero County, with headquarters in La Junta. The unit is maintained jointly by the county and the state in coöperation with the Otero County Medical Society.

DR. MARCUS W. PASCOE has been appointed Health Officer of the city of Shafter, Calif., in Kern County, recently incorporated.

DR. FELIX R. ROSSI, JR., has been appointed Health Officer of Fairfield, Calif., to succeed DR. CARLTON C. PURVIANCE.

Canada

A. GRANT FLEMING, M.D., D.P.H.,* of McGill University, Montreal, Que., has been appointed a member of the Medical Research Committee formed by the National Research Council of Canada, to study the organization of medical research in Canada.

Philippine Islands

DR. EUSEBIO D. AGUILAR, of Manila, P. I., has been appointed Director of the Bureau of Public Welfare for the Islands.

DR. GREGORIO LANTIN, of Manila, has been made head of the medicolegal section of the Department of Justice.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

American Academy of Tuberculosis Physicians. San Francisco, Calif. June 13-14.

American Association of Industrial Physicians and Surgeons—23rd Annual Meeting; and Second Annual Midwest Conference on Occupational Diseases. Palmer House, Chicago, Ill. June 6-9.

American Association of Medical Social Workers. Seattle, Wash. June 26-July 2.

American Association of Pathologists and Bacteriologists. Atlantic City, N. J. May 3-4.

American Association of Psychiatric Social Workers. Seattle, Wash. June 26-July 2.

American Association of Social Workers—Joint Meeting with American Association of Schools of Social Work, and National Conference of Social Workers. Seattle, Wash. June 26-July 2.

American Association of the History of Medicine. Atlantic City, N. J. May 2.

American Federation of State, County, and Municipal Employees. Atlanta, Ga. August 29.

American Heart Association. Sir Francis Drake Hotel, San Francisco, Calif. June 10-11.

American Dental Association. St. Louis, Mo. October.

American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9-14.

American Home Economics Association—31st Annual Meeting. William Penn Hotel, Pittsburgh, Pa. June 28-July 1.

American Medical Association. San Francisco, Calif., June 13-17.

American Medical Women's Association—National Convention. Fairmont Hotel, San Francisco, Calif. June 12.

American Public Health Association — 67th Annual Meeting. Hotels Muehlebach, President, Kansas Citian, Kansas City, Mo. October 25-28.

American Public Welfare Association

- Joint Meeting with National Conference of Social Workers. Seattle, Wash. June 26–July 2.
- American Veterinary Medical Association. New York, N. Y. July 5–9.
- American Water Works Association. Montana Section. Baxter Hotel, Bozeman, Mont. May 13–14.
- Pacific-Northwest Section. Davenport Hotel, Spokane, Wash. May 19–21.
- Florida Section. Daytona Beach, Fla. May 23–25.
- New Jersey Section. Hackensack Water Company Plant, New Milford, N. J. May 25.
- Association of American Physicians. Atlantic City, N. J. May 3–5.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13–15.
- Better Parenthood Week. Sponsored by The Parents' Magazine in cooperation with the U. S. Children's Bureau. May 1–7.
- Central Atlantic States Association of Dairy, Food and Drug Officials. Claridge Hotel, Atlantic City, N. J. May 12–13.
- Child Health Day, National. May 1.
- Congress of American Physicians and Surgeons. Atlantic City, N. J. May 2–6.
- Connecticut Public Health Association. Stratfield Hotel, Bridgeport, Conn. May 25.
- Governmental Research Association. Princeton, N. J. May.
- Hawaii Territorial Medical Association. Honolulu, T. H. May 20–22.
- Health and Accident Underwriters Conference. Chicago, Ill. May 24–26.
- Health Officers and Public Health Nurses—Annual Conference. Under the Auspices of the New York State Department of Health. Saratoga Springs, N. Y. June 22–24.
- International Assn. for Dental Research. Minneapolis, Minn. May 12–13.
- International Association for Identification. Columbus, Ohio. August 16–20.
- International Association of Medical Museums, American and Canadian Section—with American College of Physicians and Surgeons. Atlantic City, N. J. May 2.
- Iowa Public Health Association. Des Moines, Ia. May.
- Manufacturing Chemists Association of the United States. Sky Top, Pa. June 2–3.
- Medical Library Association. Hotel Somerset, Boston, Mass. June 28–30.
- Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13–15.
- Michigan Public Health Association. Lansing, Mich. November 9–11.
- Mississippi Valley Conference on Tuberculosis—25th Annual. Twelve states represented. Hotel Statler, St. Louis, Mo. September 21–24.
- Missouri Public Health Association. Jefferson City, Mo. May 13–14.
- Mothers' Day. May 8.
- National Conference of Social Workers—Joint Meeting with American Association of Schools of Social Work, and American Association of Schools of Social Work. Seattle, Wash. June 26–July 2.
- National Education Association. New York, N. Y. June 26–30.
- National Hospital Association (Negro). Hampton, Va. August 14–16.
- National Tuberculosis Association. Biltmore Hotel, Los Angeles, Calif. June 20–23.
- New England Health Education Association—12th Annual Conference. Pratt Building of Naval Architecture, Cambridge, Mass. June 3–4.
- New Mexico Public Health Association. Las Vegas, N. M. October 30, 31, November 1.
- New York State Association of Public

- Health Laboratories—22nd Annual Meeting. Mary Imogene Bassett Hospital, Cooperstown, N. Y. May 23.
- New York State Department of Health—Annual Conference. Saratoga Springs, N. Y. June 28–30.
- New York State Sewage Works Association—Fall Meeting (joint meeting with New England Sewage Works Association). Hotel Bond, Hartford, Conn. October 6–8.
- New York State Sewage Works Association—Spring Meeting. Buffalo, N. Y. June 3–4.
- Pacific Coast Branch of State Registration Executives. Hotel Multnomah, Portland, Ore. June 6–8.
- Pennsylvania Public Health Association. Penn-Harris Hotel, Harrisburg, Pa. May 19–20.
- School Health Education Institute—sponsored by the University of Michigan. Michigan Union, Ann Arbor, Mich. May 27–28.
- Smoke Prevention Association. Nashville, Tenn. May 17–20.
- Social Work Publicity Council. Seattle, Wash. June 26–July 2.
- South Carolina Public Health Association. Myrtle Beach, S. C. May 23–25.
- State Charities Aid Association—State and Local Tuberculosis and Health Committees. Hotel Commodore, New York, N. Y. May 24–26.
- Texas Public Health Association. San Antonio, Tex. November 7–9.
- Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2–9, 1939.
- Western Branch, American Public Health Association. Hotel Multnomah, Portland, Ore. June 6–8.
- International Union of Local Authorities. Bucharest, Roumania. June 13.
- Ontario Health Officers' Association. Chateau Laurier, Ottawa, Ont., Canada. June 17–19.
- Canadian Public Health Association. Lord Nelson Hotel, Halifax, N. S., Canada. June 20–22.
- Royal Sanitary Institute. Portsmouth, England. July 11–16.
- Scientific Congress of Doctors and Dentists—"ARPA." Prague, Czechoslovakia. July 21–25.
- International Medical Society for Psychotherapy—10th Annual Congress. Balliol College, Oxford, England. July 29–August 2.
- British Dental Association. Belfast, Ireland. July 29–August 3.
- International Meeting for Cell Research. Anatomical Institute, Zurich, Switzerland. August 7–13.
- International Congress on Housing and Town Planning. Mexico City, Mexico. August 13–20.
- Sixteenth International Physiological Congress. Zurich, Switzerland. August 14–18.
- British Association for the Advancement of Science. Cambridge, England. August 17–24.
- International Veterinary Congress, Thirteenth. Zurich and Interlaken, Switzerland. August 20–27.
- International Congress for the History of Medicine, Ninth. Zagreb, Yugoslavia. September 3–11.
- Special International Conference on Sewage Works and Disposal. Glasgow, Scotland. September 12–18.
- International Congress of Tropical Medicine, Third. Combined with Third International Malaria Congress, which was to have been held in Madrid in October, 1936. Amsterdam, The Netherlands. September 24–October 1.
- Pan-American Congress of Municipalities. Havana, Cuba. November.

FOREIGN

- International Association of Public Employment Services. Ottawa, Ont., Canada. May 26–28.

Best Sellers in the Book Service for April

Manual of Public Health Nursing (2nd ed.)—National Organization for Public Health Nursing.....	\$1.50
Rural Health Practice—Harry S. Mustard, M.D.....	4.00
Principles of Medical Statistics—A. Bradford Hill.....	2.25
How to Use Pictorial Statistics—Rudolph Modley.....	3.00
Graphs: How to Make and How to Use Them—Herbert Arkin and Raymond R. Colton.....	3.00
Apes, Men and Morons—Ernest A. Hooton.....	3.00
Disease and Destiny—Ralph H. Major, M.D.....	3.50
The Treatment of Clinical and Laboratory Data—Donald Mainland.....	4.50

Order from the Book Service

The American Public Health Association
 50 West 50th Street ° New York, N. Y.

*The Twenty-Seventh Annual Meeting
 of the*

*Canadian Public Health Association
 will be held in*

Halifax, Nova Scotia

on Monday, Tuesday and Wednesday

June 20, 21 and 22, 1938

Headquarters: The Lord Nelson Hotel

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

June, 1938

Number 6

Problems of a Housing Enforcement Program

L. M. GRAVES, M.D., AND ALFRED H. FLETCHER, F.A.P.H.A.

*Superintendent; and Sanitary Engineer, Department
of Health, Memphis, Tenn.*

THE diagnosis of the problem of providing decent and sanitary homes for the lowest income group seems to be definite and clear-cut, and yet its solution is many sided. The diagnosis is poverty—poverty of the tenants and poor income to the owners of the slum dwellings. The solution, however, is not simply that of publicly subsidized housing, enforcing sanitary and housing ordinances, slum clearance, great private housing developments—nor all these together.

The solution in its entirety must include provisions for people who are poor; those who have no steady jobs; those on relief; those who are old or blind; those whose husbands may be habitual drunkards or known by social agencies as "good for nothings"; those whose income will permit the payment of only \$1 a week rent for the entire living unit whether they need 1 room or 5 rooms; those who can pay only \$2 a week rent; and those who can pay only \$3 a week rent for the entire living unit. In Memphis this group includes approximately 50 per cent of the population, 80 per cent of this 50 per cent

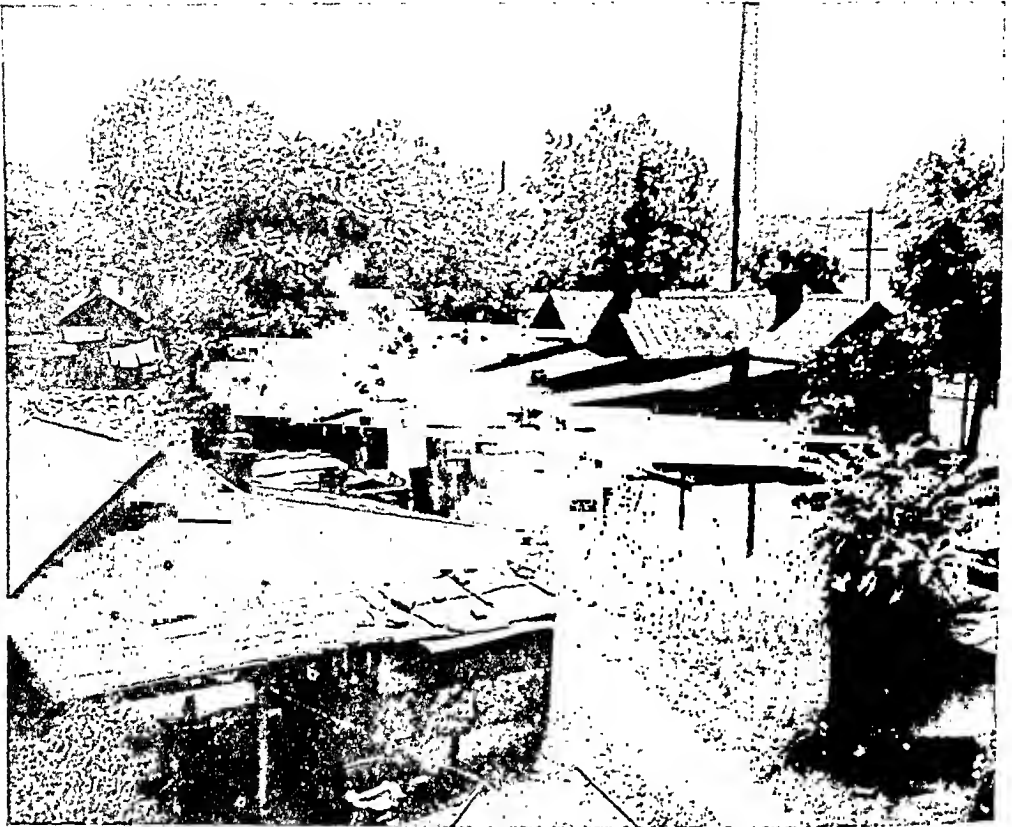
being negroes. These are facts and not estimates.

It is the problem of housing poor people, then, which to public health departments and possibly to other interests is the most important of all. Without an attack on this lowest income group, there will be no permanent, substantial, public health improvement. Sanitary facilities in the home cannot be rented or maintained under present conditions by poor people. There is no agency or program now aimed, at least not so as to hit the bull's-eye, at this lowest income group. Some, in fact most, of the above listed groups in which the greatest housing needs exist, are not eligible for housing in federal housing projects.

There is some truth in the oft repeated statement that

... new large scale good housing built for the large middle class income groups will release moderately good housing for occupancy by the next lower income groups, bringing about a general upward movement that will empty slum properties for the wreckers.

However, studies of the slums in



Dilapidated Houses in the \$1 to \$1.50 a Week Rental Class

Memphis indicate that this oft repeated quotation is not complete and should be amended to read:

... new large scale good housing for the large middle class income groups will release moderately good housing for occupancy by the next lower income group, bringing about a general upward movement of people that will empty many slum properties for the wreckers and will thus take the cause of slums into slightly better housing to turn it into a slum for future emptying.

A slum is a slum because there is no income, or insufficient income to build or maintain the housing in a decent or sanitary condition. An upward movement of poor people into a better housing area can bring blight and disaster to any district with distressing rapidity. In the long run, \$1 a week will rent a \$1 a week house and \$2 a week will rent a \$2 a week house.

In trying to arrive at the solution, it should be recognized that an average figure or picture of housing or slums for the United States may be misleading for any individual section, or city of the United States. An average picture of conditions for the country as a whole, based on actual facts and not estimates and guesses, may indicate that 9.6 per cent of the shortage in non-farm family dwelling units exists in the rental group paying less than \$10 a month rent, while a picture of conditions in Memphis indicates that this figure if used to show needs for housing is grossly misleading. Eight and six-tenths per cent of all dwellings in the city are dilapidated to the point that it would not be practical to attempt patching or remodeling to meet a minimum standard. These dilapidated dwellings are occupied by the people in

TABLE I

*Rentals, Vacancies and Crowding Classified According to Degree of Bad Housing**

Housing Index †	Total Units Occupied	Total Population Housed	Per cent Vacant	Average Weekly Rent per Unit	Average Rooms per Unit	Average Weekly Rent per Room	Average Persons per Room
0 to 29	2,342	7,487	4.87	\$1.82	2.91	\$0.620	1.09
30 to 49.9	7,670	27,276	6.49	2.34	3.31	0.708	1.07
50 to 64.9	7,290	28,440	4.27	2.92	3.93	0.740	0.99
65 to 79.9	5,571	24,488	4.29	3.92	4.69	0.830	0.93
80 to 100	5,894	30,321	3.26	6.97	6.29	1.108	0.81
Totals	28,767	118,142	4.59	3.70	4.31	0.850	0.95

* See *American Journal of Public Health*, July, 1937, p. 653 (Table I, Ref. 1 for Comparison with 1936 figures).

† "The housing index is a numerical value computed for each dwelling and for each block of dwellings, and indicates that the block averages a certain per cent of a minimum standard. The 0 to 29 per cent group, for example, includes all blocks whose average housing index for all dwellings in the blocks is less than 30 per cent of a minimum standard. The minimum standard arbitrarily adopted for Memphis is a dwelling that is constructed reasonably tight to protect the occupants from the weather; screened for protection against flies and mosquitoes; provided with inside private wash-down toilets; a water faucet and sink connected to the sanitary sewer; served by the municipal water supply; provided with adequate natural light and ventilation; having adequate provisions made for the use of heating facilities; facing a street and in a reasonable state of repair."

"The key facts for judging the dwellings surveyed are: (1) Location, condition, and use of toilet; (2) location, condition and use of water and sink; (3) condition of screens, roofs, floors, walls, ceilings, and chimneys; (4) the number of families provided for by the dwelling; (5) the number of persons housed per room; (6) the position of the dwelling on the lot (front or rear).

These factors when assigned more or less arbitrary numerical values, with deductions for unsatisfactory condition of the various items, give a picture of the degree of bad housing in comparison with the accepted minimum. The resulting figure for a dwelling is called the sanitary rating or factor. By grouping dwellings into blocks of dwellings, and combining with this figure the value referred to as a rear dwelling factor, a picture is obtained of conditions as they vary from block to block and area to area.

The scoring system is based on the allowance of such credit for the number (and in some cases the convenience) of water supply facilities and toilets, as well as for the general structural condition of the dwelling and for the number of persons housed per room. Deductions are made, depending on the degree of unsatisfactoriness of these items." The system of grading is described in detail in "A Yardstick for Slums," by Alfred H. Fletcher, *Engineering News Record*, August 26, 1937.

the \$10 and under rent group. Seventy-three per cent of the colored and 6 per cent of the white population, or 34.5 per cent of the total population, live in the poorest of substandard housing and pay less than \$9 a month rent. Other figures prove beyond a doubt, if need is the criterion used, that the greatest need for housing in Memphis is in the \$10 a month or less rent group. This group is not, of

course, of interest to private capital since the returns are not sufficient for the most part to meet expenses.

MEMPHIS PROGRAM

In an attempt to develop a fundamentally sound housing enforcement program, the Department of Health has made a series of studies as to the make-up of the Memphis slums. The first survey in 1933 and 1934 which

covered the entire city, seemed to show a definite relationship between outdoor communal toilets and typhoid fever, and between housing when grouped according to a housing index and infant mortality. The second study in 1936 and 1937 indicated that a slum is not uniform and may be classified into varying degrees of "slumness," with cores of the very worst type of slum in the center or centers, and varying degrees of progressively better slum housing radiating out from the centers or cores to the rim or blighted area. This blighted rim serves as a barrier between the slums and standard housing areas.

Table I summarizes the results of the 1936 and 1937 study, which was previously discussed in an article by the authors,¹ when the study was about 40 per cent completed. This table presents data from approximately 80 per cent of the total substandard housing areas of Memphis.

This two year summary verifies the conclusions of the 1936 report that,

The law of supply and demand is plainly indicated. As the rents decrease the housing gets worse, the vacancies increase, crowding increases, and rooms per unit decrease. It would seem to point the way to where to apply enforcement proceedings in order to get the greatest returns for effort expended. Private capital getting reasonable rents and not furnishing a minimum standard house should be forced, and should welcome this enforcement on all owners without exception, to meet the standard in order to bring all houses in the blighted areas up to a decent standard. However, any effort to enforce minimum standards in the very low rental slum areas where the existing conditions are very bad can result only in slum clearance. This effort is worth while only where there is a sufficient per cent of vacancies, and should be directed toward the elimination of the worst dwellings.

FUTURE PLANS

The question may well be asked, as a result of these studies, what are the plans for the future housing enforcement program of the Department of

Health and what will this program accomplish in the way of improving existing conditions? As a result of these studies up to the present time, when viewed from a public health standpoint, several fundamental facts stand out:

1. The poorest people live in the poorest houses for which the lowest, if any, rents are collected.

2. There is a definite correlation between rents paid and the score made by the dwellings as judged from the standpoint of housing conditions by the Department of Health.

3. In view of the facts upon which the second fundamental statement made above is based, there seems to be some basis for the assumption that much of the public resentment, as well as the resentment of students of housing, against the greed and selfishness of owners of slum housing is unwarranted. The number of conveniences and sanitary facilities and their maintenance improve where economic rents are paid and decrease directly as rents decrease.

4. It is felt that if a planned concerted drive is made for the strict enforcement of a housing ordinance on the section of the slum paying the best rents, much permanent good can be accomplished in securing minimum standard housing and minimum standard housing areas or neighborhoods. Such a program should and will enlist the hearty cooperation of property owners who will benefit by this uniform enforcement for a neighborhood.

The blighted area or outer rim of the slum characterized by higher rents and better sanitation is undoubtedly the most promising field for securing improvements by an energetic enforcement program. Owners are better able to meet these demands because of better returns, and the general improvement of the area as a unit will be helpful in attracting paying tenants as the dilapidated, insanitary houses in this area are brought up to the minimum standard or are vacated and torn down. Of course, the tenant paying less than an economic rent will be forced to pay more or move. A gradual screening or squeezing program of this sort will



Memphis Houses with Outdoor Communal Toilets and Water



Houses on the St. Louis West Riverfront

eventually progress to the point where the owners will find it uneconomical to meet the demands of the Department of Health and houses will be vacated and in many cases torn down as the demands are enforced. This point will be reached when the "illusive sharp dividing line which is obviously impossible to determine" is reached. It seems that few cities have used the enforcement weapon in the most strategic manner in improving and decreasing the size of their slums. It is planned to continue the enforcement program in Memphis as initiated early in 1936 along the lines suggested above.

ENFORCEMENT AGENCIES AND PUBLICLY SUBSIDIZED HOUSING AGENCIES BOTH WORKING ON TOP SECTION OF SLUMS

It may be noted here that the enforcement agencies and the publicly subsidized housing programs are both working on this top section of the slums. The term "subsidized housing agency" as

used in this paper refers to any agency that does now, or might be set up in the future to assist tenants individually, or as a group, in obtaining a minimum standard house by subsidizing their rent, either indirectly through capital grant subsidy or annual rent subsidy to the tenant, or indirectly through individual rent subsidy to the individual owner of houses rented to eligible tenants, or in any other similar manner.

In an attempt to visualize the housing problem in Memphis and to illustrate the present weakness in the method of attack, two charts have been prepared showing the population of Memphis as a bar or a column and showing the per cent of people in Memphis in certain classes or groups as per cents of the length of the bar. One of these charts is based on figures from the 1933-1934 housing survey of the entire city and the other is based on figures from the 1936-1937 studies of the slums and blighted areas of Memphis.

Chart I representing the 1933-1934 figures, indicates that over one-half of the population of Memphis pay less than \$3 per week, or \$13 per month rent for the entire living unit. It can also be noted that a very large part of this group paying such a low rent are negroes and that almost the entire negro population fall within this very low rental classification. Our housing problem, it can be seen from this, is largely a problem of housing the negro whose income is exceptionally low. Less than one-fourth of the negro population pay as much as \$2 a week rent. If \$5 or \$6 a room per month is the rental set for the federal housing projects, then the zone from which occupants of these two projects will be drawn will undoubtedly be somewhere near as shown on Chart I, *i.e.*, in the neighborhood of the 54 per cent line. The public health need, however, for subsidized housing is greatest in the bottom section of the bar where housing conditions are worst.

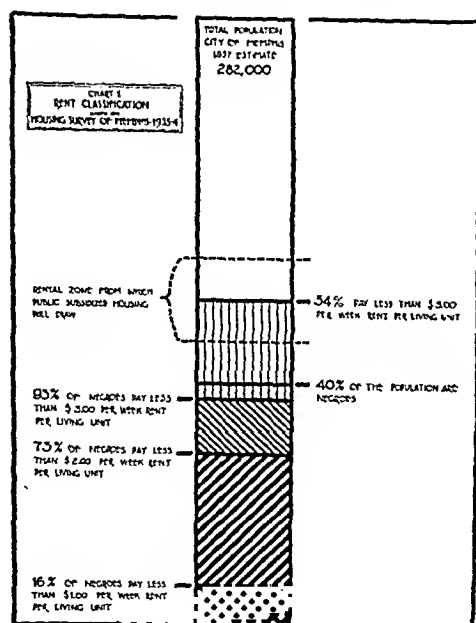


CHART I—Rent Classification Based on
Housing Survey of Memphis,
1933-1934

This is where the rents collected are the lowest, since the people living here are the poorest. In addition, the enforcement agency can best handle, in fact, can only handle the problem for permanent and effective results in the top section of the slums.

Chart II using the 1936-1937 figures, outlines a rental classification of 118,142 people with the survey estimated as approximately 80 per cent completed. This represents approximately 30,000 dwellings. It can be seen that the average rent paid by the three lowest classifications which is 66 per cent of the estimated 50 per cent of the population who live in the substandard areas is less than \$3 per room per month.

The rental zone for the federal housing projects is shown as just above the 50 per cent line, since rentals in the federal projects are expected to be in the \$5 and \$6 per room per month class. As pointed out in the discussion of Chart I the greatest public health need is in the bottom section of the bar or population where housing conditions are worst. Here the rents are lowest because the occupants are poorest.

It should be evident, therefore, that publicly subsidized housing and enforcement programs are both working on the same group and, if an energetic publicly subsidized housing program is carried on, the housing enforcement agency will probably have to withdraw from its program. The drawing or fear of drawing the cream of the paying tenants away from private owners of houses catering to this group will make it almost impossible to get their co-operation because of what will be referred to as unfair competition. The Department of Health will then have to and probably should confine its activities to alleviating complaints as best it can and carrying on a generally admitted impossible, ineffective, educational campaign of teaching slum dwellers to live healthfully without ade-

quate and satisfactory sanitary facilities. It may be said here that this paper should in no way be considered as criticism of the two federal housing projects in Memphis, but as pointing to the great need for housing for the "forgotten children" of families unable to pay an economic rent and living under the worst conditions of insanitation and dilapidation.

COÖPERATIVE PROGRAM DESIRABLE

On the other hand, a coöperative program would seem to promise the most rapid and effective housing program that could be devised. The enforcement agencies could concentrate on the top section or blighted areas of the slums and work down the scale as far as possible, requiring minimum standards in these better sections of the slums where rents are paid and condemning all dilapidated and non-conforming houses. Then the publicly subsidized housing program could supply houses for the group that pay almost no rent, for those on relief, or for

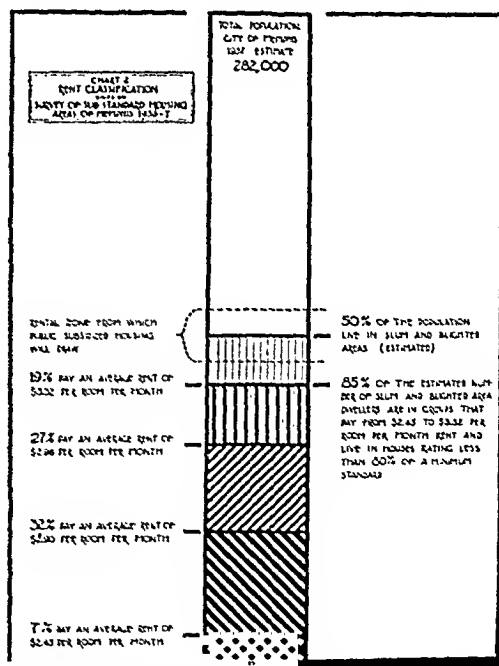


CHART II—Rent Classification Based on Survey of Substandard Housing Areas of Memphis, 1936-1937

those who can pay only at times. Publicly subsidized housing could have as its goal, then, the lowest 5, or 10, or even 15 per cent without worrying about this "illusory sharply dividing line which obviously cannot be determined." The dividing line in the lowest 15 per cent can be taken as zero and would be a logical base line from which to start developing a publicly subsidized housing program. It seems entirely possible then for the enforcement agency to start at the top of this slum dwelling group, let us say 30 per cent of our population, and by working down the scale could actually force minimum standards to be met by some 10 or possibly 15 per cent of our population, so that the enforcement program would meet the publicly subsidized housing program half-way between the upper and lower lines.

HOUSING FOR RELIEF WORKERS

The second of the last two housing studies in Memphis was made of the Works Progress Administration work relief rolls and the general direct relief rolls as of June, 1937. It was found that approximately 80 per cent of these WPA clients and 86 per cent of the general direct relief clients, including both white and colored, live in the slums of Memphis. This statement is based on the fact that they live in blocks which rate less than 80 per cent of a minimum standard for decent housing as determined by the Department of Health.² It should be pointed out here that the Memphis Health Department minimum standard, which is the standard referred to throughout this discussion, is considerably lower than the federal public housing minimum standard. The Memphis Health Department minimum is possibly lower than the average citizen would consider essential to decent living. It does not include electric lighting or gas connections, running hot water, any system

of heating except flues so located that the occupant can install stoves and have flues for proper venting. It also does not include a bathtub and other items included in the present publicly subsidized housing projects. The results of the study are summarized in Table II.

It may be pointed out that although a high per cent of both white and colored people on work relief live in the poorest types of housing, the per cent of colored living in the two lowest groups is almost 3 times the per cent of whites living in the same types of housing. This trend continues in the group on direct relief although the difference in the per cent falling in the lowest classes between colored and whites is not as great. The rates of both white and colored on direct relief in the groups living under the worst housing conditions are approximately 5 points higher than the same groups on work relief.

HOUSING FOR RELIEF CLIENTS IMPORTANT

Of course, the question may arise in the minds of many as to whether we will always have people on relief. No doubt the relief load will vary considerably, with a minimum load during good times and a maximum load during depression. It is possible, therefore, that for the very lowest group or for the relief group the present program of publicly subsidized housing is not the solution. Nevertheless, from a public health standpoint, this is the most important group to be provided for, and unless the present program is changed considerably the Department of Health will be hindered rather than helped in its effort to provide better sanitary conditions for slum dwellers.

It might be found desirable to see to it that those on relief be furnished minimum standard housing as a part of their relief through government leas-

TABLE II

Distribution of WPA and Direct General Relief Clients According to Housing Condition
*Works Progress Administration Relief Rolls **

Legend	White		Colored		Totals	
	Per cent	Accumulative Per cent	Per cent	Accumulative Per cent	Per cent	Accumulative Per cent
0 to 29.9	6.6	....	24.7	....	15.0	....
30 to 49.9	16.9	23.5	34.5	59.2	25.1	40.1
50 to 64.9	23.5	47.0	18.6	77.8	21.2	61.3
65 to 79.9	21.5	68.5	11.6	89.4	17.0	78.3
80 to 100	31.5	....	10.6	....	21.7	....

General Direct Relief Rolls †

0 to 29.9	10.0	....	24.4	....	18.2	....
30 to 49.9	21.1	31.1	40.7	65.1	32.3	50.5
50 to 64.9	26.6	57.7	18.5	83.6	22.0	72.5
65 to 79.9	18.2	76.0	9.8	93.0	13.4	85.9
80 to 100	24.1	....	6.6	....	14.1	....

* A 25 per cent sample of the 5,588 families on the rolls, June, 1937.

† 100 per cent of the families on the rolls surveyed.

ing of approved, privately owned houses. This method would result in much repair and improvement work both on the houses and in the spacing of groups of houses. An added advantage in this plan would be the elasticity of leasing the number needed to care for the relief load. As the clients leave for private employment, the demand for private houses increases and the need for leased houses decreases. Another

problem at this bottom section of the slum may be the mentally deficient ones or families in which the breadwinner is worthless, shiftless, lazy, given to drunkenness, and otherwise unfit to provide for the family. Some type of institutionally directed self-supporting project may be the answer to this problem.

There are in every city—and Philadelphia is no exception—many families who have be-

come so degraded they do not know how to live in a hygienic way. There are problem families who need case work treatment. Nine out of 10 families will respond to good housing, but no amount of good housing will lift others out of the depth into which they have fallen. Some are mental cases, some health cases, some are degenerates. They would bring even good houses down to the level of the slum houses. For the sake of society they must be reclaimed or segregated under municipal control. Until they and others less subnormal who persistently practice sloppy living are forcibly restrained from fouling the houses they occupy, they will continue to make slums. Such families should be subjected to the compulsion of instructive inspection, and when such educational approach proves inadequate they should be removed to municipal colonies, forced to labor in the open, given medical and social treatment, and be allowed to leave such control only when they have demonstrated they can so maintain hygienic living that they will not be a menace to society.³

These suggestions are made to indicate possibilities rather than to attempt to solve a most difficult problem. The solution of this, however, is most important from a public health point of view and if not definitely included in the housing program, will discourage public health workers in trying to realize any benefits, and, it would seem, will take from the housing program most of the public health arguments used to justify it.

PRESENT GOVERNMENT HOUSING SUCCEEDS OR FAILS IN ITS OBJECTIVES

If the present publicly subsidized housing program is designed to help the man who has a house to live in that does not leak, has a private toilet and running water, has screens and windows, etc., but who lacks hot water or steam heat, plenty of yard space and grass and flowers, gas, mechanical refrigeration, and other necessities for an abundant living, at a reasonably low cost, then it has been successful in achieving that goal.

If, however, the publicly subsidized housing program was designed partly at least to improve the sanitary conditions for people living without private toilets, without running water, without screens and windows, with leaking roofs, etc., then the program to date is a partial failure.

As worked out to date, it is providing a more abundant living for the low wage earner who is able to have a decent sanitary home without many conveniences only through sacrificing, but does nothing for the man or his children who live in a dilapidated, insanitary, poorly maintained house.

OBSERVATIONS AND CONCLUSIONS

1. The solution to the problem of providing decent and sanitary homes for the lowest income group is many sided, with poverty standing out as the prime underlying cause.
2. The contention that building houses for the middle class in order to help people in the slums is fallacious in Memphis.
3. The poorest people must of necessity live in the poorest houses and wherever the poorest people live they will sooner or later produce the poorest houses because of the inevitable lack of sufficient funds to maintain the minimum requirements. It may be conversely expressed as "any raising of the standard of existing housing must be followed by a corresponding increase in rents if the improvements are to be permanent."
4. The owners of slum dwellings maintain these dwellings under existing conditions, in general, in as sanitary and as decent a state of repair as is justified by the low rent collected.
5. The Department of Health, as the enforcement agency, can work on the top rental section of the slum dwellers, which is the same section that publicly subsidized housing projects are designed for. A coöperative program with publicly subsidized housing projects working on the lowest group and with the enforcement agencies working on the top group of slum dwellers, is desirable.
6. Poverty and relief are very closely associated, but people falling in these classifications are not eligible for housing in federal housing projects and are not amenable to improvement of housing standards through enforcement. There is no agency or program

now directed toward the relief of this group in the way of providing them with decent sanitary housing.

7. Eighty per cent of the people on work relief and 86 per cent of the people on direct relief live in the slums of Memphis.

8. Unless the publicly subsidized housing programs are redesigned or expanded in order to supply decent sanitary housing for people in the worst sections of the slums, the program will not enlist or deserve the continuing active support of public health departments, or officials even though they will surely not oppose it.

9. If subsidized housing does not include the lowest 10 per cent, then health departments can only attempt the impossible process of trying to educate slum dwellers to live healthfully in the slums without adequate or properly maintained sanitary facilities.

REFERENCES

1. Graves, L. M., and Fletcher, A. H. *Developing a Housing Program in a Southern City.* *A.J.P.H.*, 27, 7:645 (July), 1937.
2. Fletcher, Alfred H. *A Yardstick for Slums.* *Eng. News Rec.*, Apr. 26, 1937.
3. *Housing in Philadelphia*, 1935.

Medical Writing

"IT is, indeed, a pity that this golden age of medicine does not coincide with the golden age of literature. Many important facts and ideas are buried, or at least in part concealed, by verbose or clumsy or otherwise inferior writing. In this matter the early education and environment of the doctor are often at fault. Not only has much of the fundamental cultural training of the youth been neglected, but even the rudiments of penmanship, spelling, grammar, and literary style are often too hastily covered to establish good habits in the student of the present generation. It has become almost a commonplace that the average doctor writes illegibly, spells atrociously, constructs barbaric sentences and paragraphs, and has an uncouth literary style. Since it is impossible to tell in childhood who will be the writers of medicine in the next

generation, it would be wise to require of applicants for admission to the medical schools in the future a truly classical as well as a scientific fundamental education. The inclusion of Greek and Latin in language and literature, French and German, English in all its aspects, and history and archaeology in the pre-medical curriculum might easily make the difference between enjoyment and profit on the one hand and disappointment and neglect on the other, both in the reading and in the writing of important medical scientific papers and treatises. More and more we shall realize the truth of this, and shall strive to emerge from the barbarism of the medical literature of today to a higher level." — Gerrish Memorial Lecture: *Doctors and Books.* *New England J. Med.*, 218:338-343 (Feb. 24), 1938; *J. Assoc. Am. Med. Colleges*, May, 1938.

The Epidemiology of Trichinosis*

C. D. BARRETT, M.D., F.A.P.H.A., AND RICHARD SEARS, M.D.

*Director, Bureau of Communicable Diseases; and Field Epidemiologist,
State Department of Health, Lansing, Mich.*

WORK done by recent investigators places squarely before public health workers the question—Is trichinosis a serious public health problem, and if so, what can we do about it? The data submitted in this paper do not answer either of these questions, but we hope they show some of the intricacies of the problem and throw some light on what needs to be done and what information needs to be assembled.

Hall and Collins¹ have reported that in a group of 1,778 autopsies which they believe constitutes a fairly composite sample of American people, not less than 12½ per cent showed infestation with trichina. Dr. C. V. Weller, pathologist at the University of Michigan Hospital, recently informed us in a personal communication that from the first 25 examinations made, using a 50 gm. diaphragm digestion method advised by McCoy,² he found 5 positive for trichinosis, while, in the second 25 no positives were found. Dr. Weller is continuing his study in order to have a larger group on which to base conclusions.

The writers' interest in trichinosis has been stimulated by discovery, within a year, of 2 relatively large outbreaks, the first in the vicinity of Rogers City, Mich., during January

and February, 1936, for which we have histories for 32 cases; the second in Capac, Mich., for the most part in December, 1936, and for this we have data for 72 cases. Capac and Rogers City are approximately 200 miles apart and have nothing in common other than that they are small towns in rural areas in Michigan. The distance of these towns from our office and the lack of hospitalization have made it difficult to study the outbreaks as thoroughly as desired.

The Rogers City outbreak occurred among a few related families and their friends, who ate sausage prepared on a farm, the owner of which was father or grandfather to most of the cases. Three of the families involved visited the "old folks" and all but 2 persons ate uncooked smoked sausage. These were the only 2 who escaped illness. Although unfortunately no eosinophil counts were made, clinical symptoms in all individuals diagnosed were quite typical. Diagnosis was confirmed by finding the organism in a sample of the sausage in question.

In the Capac outbreak we have been able to make a more complete study. Detailed histories have been obtained, based on several interviews of each case. Eosinophil counts were secured on the majority of cases from 1 to 3 months after onset. Intradermal tests as proposed by Bachman³ were made on the majority approximately 8 months

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

TABLE I—(Capac Outbreak)

Source of Pork

A—Number of Cases According to Manner of Cooking and Source of Pork Eaten During Month Previous to Onset

Source	Persons Eating Pork But No Sausage			Persons Eating Sausage, Incl. Those Who May Have Had Other Pork			Total
	Raw	Cooked More or Less	Cooked Thoroughly	Raw	Cooked More or Less	Cooked Thoroughly	
Dealer X only	0	3	0	12	12	37	64
Dealer X and Y	0	0	0	0	0	0	0
Dealer X and other (not Y)	0	0	0	1	0	0	1
Total Dealer X	0	3	0	13	12	37	65
Dealer Y	..	..	..	0	0	3	3
No Pork	..	..	..	..	..	..	4

B—Non-cases in Households with Cases, According to Manner of Cooking, and Source of Pork Eaten, 1 Month Previous to Onset

Dealer X only	0	0	2	0	13	* 57	72
Dealer X and Y	0	0	0	0	0	0	0
Dealer X and other (not Y)	0	0	0	0	0	0	0
Total Dealer X	0	0	0	0	0	0	0
Dealer Y	0	0	0	0	0	1	1
No Pork	..	..	..	..	..	..	21

* One of these was subsequently determined to be a case.

after onset. Diagnosis was confirmed on 2 cases by autopsy specimens. The diagnoses were well established in all but 2 or 3 cases. Tables have been compiled showing these data for the Capac outbreak.

The town of Capac consists of about 800 people. It is the trading center for a rural population of some 2,000 or

3,000. The fresh meat supply is almost entirely distributed through 2 retail stores, both securing their pork and beef from local farmers.

Table I shows data concerning pork eaten by those who became ill and by other members of the household. Table II gives information concerning the hogs marketed in Capac during the

TABLE II—(Capac Outbreak)

Sources of Hogs Killed and Marketed in Capac During November and December, 1936, Showing Farmer from Whom Purchased and Dealer

Dealer X			Dealer Y		
Farmer	No. of Hogs	Date Killed	Farmer	No. of Hogs	Date Killed
A	2	11- 5-36	J	2	11-18-36
B	2	11-15-36	K	* 1	12- 5-36
C	3	11-15-36	L	* 1	12- 7-36
D	1	11-15-36	M	* 1	12-12-36
E	1	11-17-36	N	* 1	12-22-36
F	5	11-25-36	O	* 1	12-31-36
G	1	12- 1-36			
H	7	12-17-36			
I	6	12-24-36			

* Dealer Y had no record of number of hogs purchased from each farmer but "usually bought a hog at a time."

month preceding the outbreak. A study of these data indicates that the pork causing the trouble was that handled by Dealer X, who sold perhaps 75 per cent of the pork consumed in Capac. Of the 72 cases, 65 gave a history of having eaten some kind of pork from Dealer X during the month preceding onset. Three stated that they had had pork only from Dealer Y. Some maintained that they had not eaten pork at any time for one month preceding onset. Sixty-one of the 72 cases ate sausage and 12 of these admit having eaten raw sausage; 12 are uncertain as to how well the sausage was cooked, while 37 housewives who cooked the sausage contended it was well done. Two members of Dealer X's family were cases, likewise 2 members of the family of a man who had a financial interest in Dealer Y's business and, therefore, customarily bought meat from him but who on one occasion bought X's sausage.

In Table III are listed the 45 families in Capac having one or more cases. In these households there were 72 or 73 individuals with trichinosis and 93 or 94 persons who escaped any noticeable symptoms. Eighteen of the 94 were skin tested and all found negative to 1:10,000 antigen. Of the 45 families there were 32 with 1 case only, and of these 32, 19 were females who may have tasted sausage in its preparation. A comparison of the 94 well individuals (Table I) in these households shows a lower percentage of them having pork or sausage than of those who were cases. None of the well individuals admit eating raw sausage and only a few were not sure that it was well cooked.

REASON FOR CAPAC OUTBREAK

The Capac outbreak was an unusually large one, but the exact source or reason for the outbreak is not evident. A study of the chronological

TABLE III—(Capac Outbreak)
*Capac Households with One or More Cases
Showing Number of Cases and
Non-cases in Each*

Family No.	No. of Cases	No. of Persons with No Symptoms
1	4	0
2	1	1
3	2	6
4	1	4
5	2	5
6	1	2
7	2	1
8	1	0
9	1	3
10	3	1
11	1	2
12	1	5
13	1	0
14	2	2
15	1	3
16	1	3
17	1	1
18	1	4
19	1	* 3
20	1	0
21	3	1
22	2	1
23	1	6
24	1	1
25	1	0
26	1	1
27	1	8
28	9	0
29	1	2
30	1	1
31	1	2
32	1	3
33	2	0
34	4	0
35	2	0
36	1	3
37	1	3
38	1	0
39	1	3
40	1	2
41	1	2
42	1	7
43	1	1
44	1	0
45	3	1
Totals	72	94

* One of these subsequently determined as a case

chart presents some interesting hypotheses. The first case of which we have a record gives an onset September 20,

TABLE IV—(Capac Outbreak)

Eosinophilia

(All data on basis of first count made in each case)

*A. Eosinophilia and Symptoms**No. of Cases According to Degree of Eosinophilia*

<i>Symptoms</i>	<i>No. of Cases According to Degree of Eosinophilia</i>					<i>No Count</i>	<i>Total</i>	<i>Average *</i>
	0-3%	4-9%	10-29%	30-49%	50% and Over			
Gastrointestinal only	1	0	5	0	1	0	7	21.7
G.I. and edema	1	2	2	2	0	0	7	19.3
G.I. and mus. pains	1	0	2	1	1	2	7	26.4
G.I., edema, and mus. pains	0	5	8	4	2	4	23	23.6
Edema only	0	1	4	1	0	0	6	21.0
Edema and mus. pains	0	4	9	2	0	1	16	19.1
Mus. pains only	1	0	2	1	0	0	4	20.5
None of 3 symptoms	0	0	1	1	0	0	2	30.0
Totals	4	12	33	12	4	7	72	21.9

B. Eosinophilia and Severity of Case

Mild	1	1	7	3	0	1	13	22.4
Moderate	1	3	11	3	1	1	20	21.7
Severe (not fatal)	2	7	15	6	3	0	33	22.4
Fatal	0	1	0	0	0	5	6	6.5

C. Eosinophilia According to Time After Onset

<i>Time Count Taken</i>								
1st week	0	2	0	1	0	0	3	18.0
2nd week	1	1	6	1	0	0	9	18.5
3rd week	0	2	5	1	0	0	8	19.2
4th week	0	3	13	4	1	0	21	23.3
5th week	3	2	7	5	2	0	19	19.9
6th week	0	1	0	0	0	0	1	6.0
7th week	0	0	1	0	1	0	2	35.0
14th week	0	1	0	0	0	0	1	6.0
17th week	0	0	1	0	0	0	1	20.0

D. Control Group (no cases in household—general population selected at random)

38	20	3 †	0	0	0	62	4.2
----	----	-----	---	---	---	----	-----

* Averages are not exact but are weighted, using the median percentage point in each column for all counts except in the 50% and over column where the minimum figure of 50 is used for each count.

† Includes one person who was later considered as a probable case.

the second October 8. The third case with recorded onset of October 15, is of uncertain onset and questionable diagnosis. The first 2 cases are definite but cannot be accounted for as a part of the outbreak proper, the first of which may be said to be that with onset November 30.

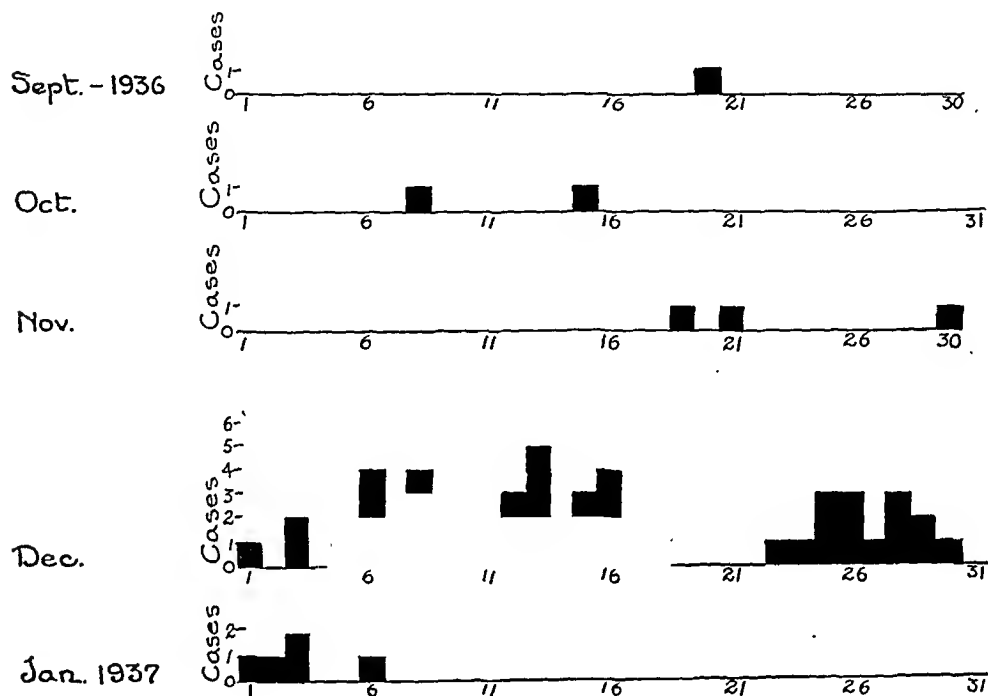
Hogs killed and marketed during November and perhaps December must account for the majority of cases. The hog purchased by Dealer X on Novem-

ber 15 from Farmer D (see Table II) was a sow of considerable age and size and was made entirely into sausage. Perhaps this one animal accounts for most or all of the cases following that date. Those cases preceding this time may be the normal sporadic incidence common to such communities. The outbreak occurred in two waves with an intermission of several days which is unexplainable. The sausage made from this one hog probably was the

FIGURE I

TRICHINOSIS IN CAPAC — CASES BY DAY OF ONSET

71 cases for which onsets were fairly definite in time



main supply sold in Capac during a period of several weeks beginning near the end of November.

CLINICAL SYMPTOMS AND SEVERITY OF CASE

The cases in the Capac outbreak have been analyzed as to clinical symptoms and in Table IV-A the different combinations of these symptoms is shown together with degree of eosinophilia. Not always is the "text-book picture" present, namely, gastrointestinal symptoms, edema and muscle pains. When gastrointestinal symptoms are present they do not always precede other symptoms.

Six of the 72 cases were fatal. Thirty-five of the non-fatal cases gave histories of diarrhea, the duration of which for 9 was less than a week, for 15 over 2

weeks, and for 8 over 4 weeks. In 48 cases there were muscle pains and in 20 of these such pains lasted for over 2 months. There was edema present in 46 cases lasting for less than 1 week in 18, and more than 2 weeks in 11 cases. Fifty-five of the 66 non-fatal cases spent time in bed due to illness, and for only 7 of these was this time less than 1 week. In 17 cases the time in bed exceeded 1 month. Fifty-three cases were in persons employed, including housewives, and of these 46 lost more than 4 weeks' work because of illness. In only 2 cases was the time lost from work less than 1 week (see Table V).

We were struck by the many complications and serious debility following the acute symptoms. Because of inability to follow closely each case

TABLE V—(Capac Outbreak)

Severity of Cases

*Number of cases according to duration of symptoms, time in bed, and time off work
(Including only those cases for which data are complete) **

	2-6 1 Day	1-2 Days	2-3 Wks.	3-4 Wks.	4-5 Wks.	5-6 Wks.	6-8 Wks.	2-3 Mos.	3 Mos. Plus	Total
Symptoms:										
Diarrhea	1	8	11	6	1	2	1	1	3	35
Mus. pains	0	2	5	4	4	7	2	4	11	48
Edema	3	15	17	4	4	2	1	0	0	48
Time in bed	0	7	10	11	10	4	4	6	2	55
Time off work	0	2	0	2	3	15	5	4	10	54

* Not including six fatal cases

we were able to tabulate in Table VI only what we believe is a very incomplete list of such complications. Eight months after onset it was common to find individuals who could not do their work because of lack of physical endurance. In a number of cases, a heart which may have been abnormal before the trichinosis, did not develop decompensation until afterward. Nervous instability occurred frequently, some patients trying to express this by saying, "I feel I can't hold myself, I just want to fly to pieces." In one instance the father of a case thought his daughter was becoming insane. On the basis of duration of symptoms and loss of time from work we have arbitrarily grouped the 72 cases as to severity as follows:

TABLE VI—(Capac Outbreak)

*Cases with Symptoms or Complications in
Addition to Diarrhea, Edema or
Muscular Pains (Partial List)*

<i>Conditions</i>	<i>No. Cases</i>
Appendicitis *	3
Bronchitis	3
Pneumonia	1
Pleurisy	1
Cardiac involvement	2
Paralysis (extremities)	2
Special senses affected	2
Symptoms suggesting involvement of central nervous system	4

* One case ruptured appendix

6 fatal, 33 severe, 20 moderate, 13 mild.

EOSINOPHILIA

We believe the eosinophil count to be the most useful laboratory aid to diagnosis—during the early stages. Although not always diagnostic it probably would be so in a very high percentage of cases if blood smears were made at frequent intervals from onset throughout the acute illness. However, severe cases may have a low count. The time after onset when the blood smear is taken is a factor in the degree of the eosinophilia found. Table VII, although giving few data, tends to indicate that the eosinophilia decreases 5 or 6 weeks after onset. In Table IV-A we have attempted to show a relation of degree of the eosinophilia to symptoms, in Table IV-B to severity of case, and in Table IV-C according to time after onset. There is also shown a control group, Table IV-D, of eosinophil counts taken from a random sample of the population of Capac excluding households having cases. Data in Table IV-C confirms that in Table VII indicating a slight rise in the degree of eosinophilia from first to fourth week. There was no apparent association of the eosinophilia with any particular symptom nor did the severity of the case appear to coincide with the degree of the eosinophilia.

TABLE VII—(Capac Outbreak)

Percentage of Eosinophilia

Showing reduction with time after onset.

The Weeks After Onset in Which Each Count Was Taken

Case No.	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th
13	52	..	..	..	..	..	..	..	..	42	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	62	..	..	..	..	..	..	..	..	13	..	..	..	..	..	..	..	..	..	..	..	..
23	..	36	..	..	..	..	..	..	..	13	..	12	..	..	..	6	..	..	..	..	..	..	..	..	..	..
25	27	..	..	..	..	..	..	..	..	..	13	..	10	..	..	..	4	..	..	..	..	..	..	..	..	..
26	35	..	..	..	..	..	..	..	..	..	..	..	..	8	..	..	..	..	..	..	..	..
33	36	..	..	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..
36	61	..	..	..	..	..	..	..	25	..	..	..	..	..	6	..	..	..	..	..	..	..	..
37*	52	..	..	..	..	..	..	..	37	..	48	..	..	..	..	..	..	..	..	..	..	..
38	..	22	..	..	..	..	..	..	..	..	..	..	..	14	..	..	..	6	..	..	..	..	..	..	..	..
42	25	..	..	..	..	..	..	..	10	..	6
52	40	..	..	..	..	..	..	..	12	..	12	..	..	..	..	..	..	..	..	..	..	..	..
55	38	..	..	..	..	..	..	..	..	8	..	..	..	..	5	..	..	..	..	..	..	..	..	..
58	19	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
62	46	..	..	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..

* Case No. 37 showed eosinophile count of 12% in 38th week

INTRADERMAL TESTS

Skin tests were used on 74 cases occurring in Rogers City and Capac as well as on a number of other cases and controls. Our antigen was prepared in the laboratory of the Michigan Department of Health by C. B. Line, veterinary pathologist. The method of preparation was a slight modification of that used by Bachman.⁴ The antigen was diluted to 1:500 and 1:10,000, and a control solution was made, using the same diluent without the antigen. Tests were made on 38 Capac individuals as controls who at the time presumably had no clinical evidence of trichinosis. Of the 38 there were 28 negatives, 1 doubtful, 3 mild positives, and 6 pronounced positives.* On re-checking, however, it was found that at least 3 of the pronounced positives and 1 of the mild positives definitely had clinical symptoms attributable to trichinosis. Twenty-one of the Rogers City cases were tested with the 1:10,000

dilution 18 months after the onset, and 17 were found positive. Fifty-four individuals in the Capac outbreak have thus far been tested with the 1:10,000 dilution, about 8 months after onset. All tests were observed for a minimum of 20 minutes. A few of those negative to 1:10,000 were retested with 1:500. The results of the 54 tests according to degree of reaction and clinical severity of case and according to eosinophilia are given in Tables VIII and IX. The few individuals found to be negative or doubtful reactors to the 1:10,000 dilution, and who were retested to 1:500 are indicated. There may be some relation between severity of clinical symptoms and degree of sensitivity to the protein of the organisms as measured by the skin test. More data on this point are needed. Sufficient time has not elapsed for our tested cases to be of value as an indication of duration of sensitivity to the trichina antigen. Thieler,⁵ Augustine, and Spink⁵ found 5 out of 7 cases positive up to 7 years after infestation while Heathman⁶ found 7 persons negative 6 to 10 years after infestation. It is important to know whether, many years after a clinical case of trichinosis,

* Our classification was as follows: Reactions showing 1 cm. or more of edema together with 2 cm. or more of erythema have been called pronounced, those with 0.5 to 1.0 cm. of edema with more or less erythema as mild, and those with any reaction less than this but differing from the control as doubtful.

TABLE VIII—(Capac Outbreak)
Degree of Skin Reaction in Relation to Severity of Case
 (Antigen diluted 1-10,000)-

<i>Degree of Reaction</i>	<i>Number of Cases According to Severity of Symptoms</i>			
	<i>Mild</i>	<i>Moderate</i>	<i>Severe</i>	<i>Total</i>
Negative	2	3	1	6
Doubtful	0	0	1	1
Mild positive	3	3	6	12
Pronounced positive	4 *	12 †	19	35
Total	9	18	27	54

* This number includes 1 case which did not react to the 1-10,000 dilution but gave a pronounced reaction to the 1-500 dilution.

† This includes 2 cases one of which gave a negative reaction and the other a doubtful reaction to the 1-10,000 dilution, but both gave a pronounced reaction to the 1-500 dilution.

the sensitivity to the antigen may be measured by the skin test or perhaps with the blood precipitin tests as proposed also by Bachman. We have done only 6 blood precipitin tests of which 2 were positive, these 6 having been positive to the intradermal test. The skin test is the more convenient procedure of the two. It usually becomes positive about 2 to 4 weeks after onset. This has been confirmed by McCoy, Miller, and Friedlander⁷ and Spink and Augustine.⁸

In Table IX has been assembled data showing degree of eosinophilia together with degree of reaction to the skin test. In 1 case with 3 per cent or less eosinophils there was a pronounced re-

action to a 1:10,000 dilution of antigen. Seven cases with an eosinophil count of from 4 to 9 per cent showed a pronounced skin reaction. Of these 7, 2 were first found negative to a 1:10,000 dilution and pronounced positives only to the 1:500 antigen. The other 5 showed pronounced reactions to the 1:10,000 dilution.

On the other hand, there were 4 with eosinophil counts in the group of 10 to 29 per cent which were negative to the 1:10,000 dilution, and 1 which was retested and found negative to a 1:500 dilution. All of those with very high eosinophil counts gave pronounced reactions to the 1:10,000 dilution.

Most of the eosinophil counts were

TABLE IX—(Capac Outbreak)
Degree of Skin Reaction in Relation to Eosinophilia
 (Antigen diluted 1-10,000)

<i>Skin Test</i>	<i>Number of Cases Having Counts of</i>						<i>Total</i>
	<i>0-3</i>	<i>4-9</i>	<i>10-29</i>	<i>30-49</i>	<i>Over 50</i>	<i>No Count Obtained</i>	
Negative	1	0	4	0	0	1	6
Doubtful	0	0	1	0	0	0	1
Mild positive	0	1	9	0	0	0	10
Pronounced positive	1	7 *	18 †	8	3	0	37
Total	2	8	32	8	3	1	54

* This number includes 2 cases which did not react to the 1-10,000 dilution, but gave pronounced reactions to the 1-500 dilution.

† This number includes 1 case which gave a doubtful reaction to the 1-10,000 dilution, but a pronounced reaction to the 1-500 dilution.

TABLE X—(Capac Outbreak)

Cases and Non-cases by Nationality

	<i>German</i>	<i>American</i>	<i>English</i>	<i>Greek</i>	<i>Belgian</i>	<i>Swedish</i>	<i>Danish</i>
Cases	38	27 *	2	1	2	1	1
Non-cases in household	32	55	1	0	6	0	0

* Twenty-two of these were of German descent of the third or fourth generation.

made from 4 to 6 weeks after the onset, while the skin tests were made approximately 8 months after.

INCUBATION PERIOD

In 25 of our cases we were able to determine with a fair degree of accuracy the date on which the sausage was eaten and the date on which first symptoms were noted. The mean incubation period for these 25 cases was 9.1 days, the median was 7 days. The longest incubation period was 17 days and the shortest 2 days. There were 4 persons in one family who ate sausage on the same day, 2 of whom definitely noted gastrointestinal disturbances 48 hours later; the other 2 after 7 and 12 days. For those cases other than the 25 already mentioned it was more difficult to ascertain the time of infestation or a definite onset, but it was certain that some of them had longer periods of incubation than 17 days. One case had an incubation period of not less than 30 days, possibly 35. Drake, Hawkes, and Warren⁹ have determined the incubation period in 14 cases as varying from 4 to 27 days.

NATIONALITY

The question of nationality and food habits is often referred to in considera-

tion of outbreaks of trichinosis. Hall¹⁰ contends that in the United States most cases occur among Americans not of German descent although he admits the attack rate may be higher among Germans. In Rogers City all the 32 cases were of German descent. In Table X we have classified the Capac cases as to nationality, considering all of those as Americans whose parents were born in this country. It will be noted that more than 50 per cent were German on the basis of this classification and it may be further stated that 22 of those listed as American were of German descent of the third or fourth generation. Germans appear to have a liking for smoked, raw or rare sausage. On the basis of our experience, this dietary habit is the cause of higher incidence among these people.

SEX, AGE, AND OCCUPATION

The Capac cases are classified as to sex and age in Table XI and as to occupation in Table XII. Also in Table XI is given classification as to sex and age of well individuals in households with cases. There is perhaps no particular susceptibility of either sex or any age group. Perhaps men eat more meat and more sausage. If so, this is offset by the fact that women who are

TABLE XI—(Capac Outbreak)

Cases and Non-Cases by Sex and Age Distribution

	<i>Sex</i>		<i>Age Distribution</i>						
	<i>M.</i>	<i>F.</i>	<i>Under 10</i>	<i>10-19</i>	<i>20-29</i>	<i>30-39</i>	<i>40-49</i>	<i>Over 50</i>	<i>Total</i>
Cases	36	36	9	6	7	16	16	18	72
Non-cases (contacts) in household with cases	50	44	15	19	17	10	9	24	94

TABLE XII—(Capac Outbreak)

Cases by Occupation

Number of Cases	Preschool	Thresher	Retired	Housework	Students	Factory Worker	Teacher	Mechanic	Merchant	Clerk	Banker	Farmer	Physician	Minister
	7	2	3	29	8	3	1	1	5	3	1	7	1	1

preparing meals often taste the raw sausage for seasoning. Children appear to have milder cases and in the Capac outbreak there was a somewhat greater number of those under 20 in households with cases who escaped having the disease than of the older ages. May this not be due to the fact that parents discourage eating of much sausage by children? Occupation appears to have had no significance in the Capac cases.

GENERAL INCIDENCE

Little is known at present as to the real incidence of trichinosis. Relatively very few cases are diagnosed and officially reported to health departments. Aldridge¹¹ could find, as officially reported cases, in all state health departments a total of 1,550 cases from 1842 to 1914. The *Public Health Reports* have listed for 1930–1934 inclusive a total of 1,480 cases occurring in 21 different states, for the year 1935, 591 cases in 18 states, and for the year 1936, 297 cases in 13 states. Mild clinical cases may be difficult to recognize but from our experience we believe physicians should diagnose without much difficulty such cases as constituted the majority in the two outbreaks we have reported. Prolonged diarrhea particularly with a greenish stool which cannot be otherwise accounted for should always call for an eosinophil count. Likewise, cases with muscle tenderness and pain should have an eosinophil count. It is true that many physicians are not aware that the trichinosis case should be reported. We have discovered recently quite by chance 3 cases in a

Lansing hospital and since we have been interested in this disease, quite a number of cases have come to our attention.

IMMUNITY

There is little evidence as yet to show whether humans develop an immunity to trichinosis as a result of small and repeated infestations. McCoy² claims some experimental immunity in rats. Swartz¹² maintains that one attack of the disease does not confer immunity. If there is such a thing as immunity this would tend to explain the large number of infestations found in autopsies and the relatively small number of cases diagnosed during life. During our investigation in Capac a few individuals were found who showed either a high eosinophil count or a positive antigen skin test, or both, but who had no ascertainable symptoms.

INCIDENCE IN HOGS

In consideration of the problem of human trichinosis, study must be given to the incidence among hogs. No doubt infestation varies greatly according to locality and to manner of feeding. One hundred examinations of pig diaphragms made in the laboratory of the Michigan Department of Health were all found negative. Fifteen of these were fed on slaughterhouse offal. Ninety-four examinations of diaphragm tissue of farm hogs were made recently by Dr. William Thorpe and Hans Ruhland of the Department of Animal Pathology of Michigan State College and all found negative.

Hall¹³ has collected data indicating that about 1 to 1.5 per cent infestation

exists in grain fed hogs for the country as a whole, and 3 to 5 times that much in garbage fed hogs. Hall outlines a suggested control program for human trichinosis based largely on restrictions of garbage feeding of hogs.

REMARKS AND SUGGESTIONS

It is the hope of the writers to continue the study of trichinosis, particularly as to endemic incidence and the amount of human disability the disease may cause. We believe our data thus far will help to reveal the significance of the antigen skin test and the eosinophil count, to add to our knowledge of the symptomatology. There are given the epidemiological characteristics of two large outbreaks. We make no other conclusions but desire to offer a few remarks and some suggestions based on a study of the literature and our own experiences.

1. *Incidence of Infestation*—Further work should be carried on in the study of autopsy material to determine the incidence of human infestation in various parts of the country. Figures presented thus far by various workers indicating 10 to 15 per cent infestation need to be corroborated. Pathologists may perhaps collect data as to degree of infestation and this may be correlated with any evidence of clinical symptoms during the life of the individual.

2. *Clinical incidence*—The clinical incidence as manifested by cases with more or less severe attacks incapacitating the individual for a time and perhaps leaving permanent disability may be far less than the percentage of individuals infested as shown by autopsy studies. Certainly the percentage of such cases is, however, greater than that which is known at present. The help of various public health workers is needed to determine the real incidence of clinical trichinosis.

a. The Practising Physician—Physicians should be informed that trichinosis may be quite common. They should be instructed as to the symptoms of trichinosis and its many manifestations. If one is on the alert the average case should not be particularly difficult to recognize. The eosinophil count is not used frequently enough. Diagnosed cases should be officially reported.

b. The Health Officer—The health officer should publicize the disease using the utmost conservatism to avoid arousing the undue fear of the public. He should collect all reports and epidemiological data concerning cases and outbreaks, ask that eosinophil counts be made, and have intradermal tests performed.

c. The Laboratory Research Worker—It is at present difficult to secure reliable trichina antigen. Some standardization is needed, also further work to show the significance and possibilities of the intradermal and precipitin tests.

d. Epidemiologists—Epidemiologists should assemble and analyze data collected by local health officers. They may also make group studies on different samples of population using the intradermal and precipitin test. They can correlate data as to incidence among hogs, and finally from all of the facts attempt conclusions.

3. *Incidence in Hogs*—Veterinary-pathologists and departments of agriculture should collaborate in the study of trichinosis by determining more completely the incidence among hogs in various parts of the country; likewise for hogs according to manner of feeding.

4. *Control*—Only if the above questions have been answered can the real solution to control be known. It may be one of control of the garbage fed hog or it may be education of the public as to the danger of raw or partially cooked pork. Perhaps such education should be directed especially to those persons with dietary habits peculiar to certain nationalities.

CONCLUSIONS

The problem of trichinosis has been reopened by data recently assembled. It requires further study. Trichinosis may be a public health problem of considerable magnitude. It cannot be dismissed as a "rare disease."

REFERENCES

1. Hall, M. C., and Collins, B. J. The Incidence of Trichinosis as Indicated by Post-Mortem Examination of 300 Diaphragms. *Pub. Health Rep.*, 52:468-490 (Apr. 16), 1937.
2. McCoy, R. O. Immunity of Rats to Reinfection with *Trichinella Spiralis*. *Am. J. Hyg.*, 14:484-494 (Sept.), 1931.
3. Bachman, G. W. Intradermal Reaction in Experimental Trichiniasis. *J. Prev. Med.*, 2:169-173 (Mar.), 1928.
4. Bachman, G. W. Precipitin Test in Experimental Trichiniasis. *J. Prev. Med.*, 2:35-48 (Jan.), 1928.

5. Theiler, H., Augustine, D. L., and Spink, W. W. Persistence of Eosinophilia and Immune Reactions in Human Trichinosis, Several Years after Recovery. *Parasitology*, 27:345-354 (July), 1935.
6. Heathman, L. S. Laboratory Diagnosis in Trichinosis. *Am. J. Hyg.*, 23:397-409 (Mar.), 1936.
7. McCoy, O. R., Miller, J. J., Jr., and Friedlander, R. D. Intradermal Test in Diagnosis of Trichiniasis. *J. Immunol.*, 24:1-23 (Jan.), 1933.
8. Spink, W. W., and Augustine, D. L. Diagnosis, with Special Reference to Skin and Precipitin Tests. *J.A.M.A.*, 104:1801-1805 (May 18), 1935.
9. Drake, E. H., Hawkes, R. S., and Warren, M. Epidemic in Maine. *J.A.M.A.*, 105:1340-1343 (Oct. 26), 1935.
10. Hall, M. C. The Complex Clinical Picture of Trichinosis, and the Diagnosis of the Disease. *Pub. Health Rep.*, 52:539-551 (Apr. 30), 1937.
11. Aldridge, F. C. Outbreak in Pennsylvania. *Am. J. M. Sc.*, 181:312-323 (Mar.), 1931.
12. Schwartz, B. Serum Therapy for Trichinosis. *J.A.M.A.*, 69:884 (Sept. 15), 1917.
13. Hall, M. C. The Rôle of the Garbage-Fed Hog in the Production of Human Trichinosis. *Pub. Health Rep.*, 52:873-886 (July 2), 1937.

Legislative Enactments in the Province of Ontario

THE following items are supplied to the *Journal* by B. T. McGhie, M.D., Deputy Minister of Health and Hospitals of the Ontario Department of Health:

The sale of unpasteurized milk in any city or town in Ontario is prohibited by an amendment to The Public Health Act. This legislation can be extended to other areas of the Province from time to time by Order-in-Council.

Authority has been given to the department to make regulations for the qualifications of medical officers of health. An act provides that a medical officer shall cease to hold office at 70 years, unless the municipal council with the approval of the Minister continues him in office from year to year to the age of 75.

Wide powers are given to the local health authorities to deal with typhoid and paratyphoid carriers. When a person is deprived of his means of livelihood by reason of an order of a med-

ical officer of health, the Province will pay him compensation, the amount to be determined by regulations.

A Cancer Remedy Act has been enacted providing for the appointment of a commission by the Government of Ontario with power to require any person in the Province to submit to the commission any substance or method of treatment used for cancer. The commission may thereupon investigate the merits of the remedy and may issue a public report of its findings.

Far-reaching changes have been made in the system of financing tuberculosis sanatoria. These were formerly maintained by municipal and provincial grants for each needy patient. Municipal liability has now been abolished and the total cost will be defrayed by the Province. It is expected that as a result there will no longer be any financial restraint upon the admission to hospitals of persons suffering from tuberculosis.

Nutrition Program in a State Health Department*

WOODBRIIDGE E. MORRIS, M.D.

Director, Division of Maternal and Child Health, State Board of Health, Dover, Del.

A PROGRAM of public education in the dietary improvement of health was conducted during the 1936-1937 school year in Kent County by the Delaware State Board of Health, in coöperation with the State Board of Education and the State Extension Service in Agriculture and Home Economics. Credit for its execution should go in large measure to the enterprise, ability, and enthusiasm of Pearl MacDonald, State Nutritionist, whose services we were enabled to share on a half-time basis by the generosity of the University of Delaware. I wish here to express our gratitude to those whose previous efforts in this field have stimulated and guided ours. I present this account to you with the hope that our organization, methods, and experiences may have some practical value to others who contemplate, or who are engaged in similar undertakings.

Let me tell you first what we did, then how we did it, and finally why we did it.

Kent County was chosen for the demonstration for several reasons. With a population of 32,000, it contains only 4 communities which might

be termed towns, or a total urban population of perhaps 9,000. It has 20 per cent negro population, the highest in the state. The death rates, except that for diphtheria, are generally higher in this than in the other counties. The 1933 maternal mortality was 168, the infant mortality was 81, the tuberculosis rate was 101. For this same year, the state maternal mortality rate was 61, the infant mortality rate 66, the tuberculosis rate 64.

Our objective was to make people realize the value of adequate nutrition to their children. The public was reached through posters, news stories, meetings, demonstrations, and circular letters to the parents of school children.

The posters used were a series obtained from the National Dairy Council, which kindly consented to our changing the verses so as to emphasize the protective foods. The news stories were printed in the Wilmington daily papers (the only dailies reaching the area) and in the weeklies issued in the county.

Seventy-two meetings were held—with parents in schoolhouses, with teachers or principals or both at these or at special conferences, and with Home Demonstration clubs, Parent-Teacher Associations, women's clubs, men's service groups, and granges (Pomona and subordinate). Through

* Read at a Joint Session of the Child Hygiene, Food and Nutrition, and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

these, the key people of the county were reached. That they were interested was indicated by the scores of questions they asked.

May I mention here a mistake I think we made in these meetings. We did not serve refreshments. Where they were on the program anyhow, attendance was nearly always much greater. A mistake we avoided was sending people away altogether empty-handed; mimeographed sheets were given out on the importance of good foods and on ways to prepare them in attractive variety. Each person was asked to take two or three of these home, to give to the neighbor who could not come.

In demonstrations, we reinforced the effort which the Home Demonstration Clubs have been making for some years. Miss MacDonald held a special leader-training meeting on Better Breakfasts for Children. The 30 who attended gave demonstrations, in turn, to 364 women in the 23 clubs of the county. In one club, every member "adopted" a young mother in the neighborhood and passed on to her nutrition information given at the meetings.

Apart from the state-wide breakfast survey which I shall describe, 260 Home Demonstration Club members conducted a home breakfast study of their own, on 651 adults and 256 children. It showed them that too little milk, fresh fruit, eggs, and whole grain products were used.

The Parent-Teacher Associations arranged garden-planning and canning meetings in 29 communities. Twelve were colored groups. Total attendance was 537. Six groups agreed to can extra vegetables to be used this year for a hot dish for the school children's lunch.

A hot dish for lunch was served at twelve one-room and two-room schools where it had not been attempted before. In the larger schools, having

cafeterias and a special school nurse, Miss MacDonald coöperated by helping the children to select good food for their money.

The principal of one small school bought four young rats for the children to feed, one pair on meat and potatoes; the other pair on fruit, vegetables, and milk as well.

Our fifth method of reaching people was by the circular letters to 4,400 families having children in school. There is no school census in Kent County. Accordingly, blank State Board of Health envelopes were taken by each district public health nurse to every school in her district. The teachers were asked to hold a letter addressing class. Each child practised writing the name and address of his parents, and finally wrote it on the envelope. The envelopes were collected by the teachers, and brought in to our central office by the nurse. The resulting mailing list proved 99 per cent accurate. The first letter was sent in the very envelope, franked by the state, which bore the child's handwriting.

Four letters were sent out during the year to this list. They were worded simply, and they reached the people who did not attend the meetings. The first stated what good food will do for the school child's health, happiness, and success. It ended: "The best breakfast, for the school child, is child-sized amounts of fruit, cereal, egg or bacon, milk, bread or toast. The school lunch should include one hot dish." It was signed by the State Superintendent of Public Instruction and the Executive Secretary of the State Board of Health.

The second letter enclosed duplicates of the mimeographed sheets handed out at the meetings, and repeated the reasons for giving children the protective foods. The third, signed by the County Agricultural Agent, advocated a year-round home vegetable garden, stated its money value, listed the kind

and cost of seed to be used, and told to whom to write for assistance with details. No direct check has been attempted on the effect of this, because an adequate one was not thought possible.

The fourth mailing was of a booklet, *Thought for Food*. It contained ten different inexpensive breakfasts, the costs and contents of several "pattern" breakfasts, dinners, and suppers, and a specific "Food Cost Guide." It was directly aimed to combat the argument so often heard: "We haven't money enough to buy the foods you say we should."

Early in the program a special personal letter was sent to the practising physicians, describing the nature and purpose of the endeavor, and asking their coöperation.

We realized before we started any of this endeavor that our public health nurses were not equipped to handle the field problems which it would plow up. Hence, as our first step, the state nutritionist gave them a special course, providing them with practical material and a working vocabulary for use in the home. Thus they were of real value to teachers and parents. Problem cases they brought to the nutritionist.

Emphasis throughout was laid upon the breakfast because this is believed to be the worst meal, from the nutrition standpoint, among rural people, and because of the physiological importance to the child of a good breakfast. To determine what our situation actually was, before the public education activity started, a survey of 6,511

TABLE I
Survey of Foods Eaten at Breakfast by Delaware School Children

Foods	6,511 White and Colored Pupils		5,308 White Pupils		1,203 Colored Pupils	
	No. of Pupils	Percentage	No. of Pupils	Percentage	No. of Pupils	Percentage
No breakfasts	130	2	86	1.6	44	4
Milk—1 glass or more	2,448	38	2,379	45	69	6
Eggs	1,802	26	1,557	29	245	20
Cereal—						
Cooked	2,226	34	1,786	34	440	37
Ready-to-serve	1,317	20	1,209	23	108	9
Fruit—						
Fresh	947	15	826	16	121	10
Canned	221	3	183	3	38	3
Dried	53	0.8	50	1	3	0.2
Syrup	352	5	318	6	34	3
Preserves	398	6	316	6	82	7
Bread—						
White	2,050	31	1,584	30	466	39
Dark	21	0.3	....	..	21	1
Biscuits	491	8	334	6	157	13
Pancakes	933	14	856	16	77	6
Toast	1,398	21	1,283	24	115	10
Potatoes	551	8	271	5	280	23
Meat (chiefly bacon, scrapple, sausage and ham)	1,414	22	1,119	21	295	24
Cocoa	939	14	844	16	295	24
Coffee	206	3	193	4	13	1

school children's breakfasts was made by the Dental Hygienists of the State Board of Health. It was done quietly, in the course of their routine conversation with the individual child, apart from the others. We believe it to be as accurate as such a survey could be. A summary of findings is available to you here at this meeting (Table I).

About half these breakfasts were inadequate, either in quality or in kinds of food necessary for good nutrition. For example, 46 per cent contained no cereal, 63 per cent contained no milk apart from that used on the cereal, 82 per cent contained no fruit, and 2 per cent of the children had come to school with no breakfast at all. On the basis of these figures, together with the knowledge of the Extension Service as to other meals, and our physical findings as to the Delaware school child's general and dental condition (*e.g.* 88 per cent dental caries), we felt justified in telling the people of Delaware that every other school child was probably, to some extent, malnourished.

Fifteen portable scales, furnished by the Delaware Anti-Tuberculosis Society, were distributed to rural schools isolated from stores where scales are available. Food records, as well as weight records, were kept by teacher and pupil. They stimulated the interest of teacher, parent, and child in the child's own health, and in the importance of food with relation to it. Three hundred sixteen pupils enrolled. The food intake for a complete week at the start, as contrasted with a week at the end, showed better breakfasts in one-third of the records through increased use of milk, eggs, and fruit. Teachers said they noticed improvement in health, and with it, improvement in studies and behavior. The veracity of such reports is always open to question, but they may at least be taken to indicate that health ideas were planted.

The axiom upon which this whole program was conducted was: The health of people varies according to the food they eat. We told the public, "The growth of children, their disposition, their posture, the condition of their teeth are all directly affected by the kind of food they eat and the way they live. When children are properly fed, they are better able to resist or throw off sickness. Also, success in their daily school work is conditioned by their daily food."

It should be noted here that this demonstration was made possible through the funds available to Delaware by the Social Security Act, through the Children's Bureau of Washington, and that Kent County was chosen, as the act requires, as a "predominantly rural area, an area of special economic distress."

As the program has proceeded, there has been an attitude of increasing interest in nutrition in relation to health among school authorities, teachers, community groups, and the laity in general. There has been general public amazement at the results of the breakfast survey, particularly at the unexpectedly small differences between the findings among the colored and among the white.

Continuation of the work is planned. It is to be intensified and enlarged, particularly with regard to the school lunch, and is to include another county, where similar health and economic conditions prevail. One method of extending it will be through the training in nutrition of local health chairmen and leaders of local groups, and then inducing them to reach individual families outside of, as well as within, these groups. A second will be through the associations of producers and distributors of the protective foods which their neighbors are too meagerly consuming—the dairymen, poultrymen, canners, vegetable and fruit growers, and

grocers. Delaware can produce enough of the protective foods so that none of her children need suffer from lack of them. We deliberately employ sensationalism and say that Delawareans are half-starving in the midst of plenty.

Results are expected to lag. It is felt that to change the eating habits of a people is nearly as difficult as to change their religion.

On the other hand, we are convinced that a state board of health can do no more fundamental service toward long-run improvement of the health of future generations than to develop an understanding of the value of a good

diet. We believe Dr. Sherman's motto, quoted in the front of our booklet: "An optimum diet would add not only years to one's life, but life to one's years."

SUMMARY

A program of public education in the dietary improvement of health was conducted during the 1936-1937 school year in Kent County, Dela. The public was reached through posters, news stories, meetings, demonstrations, and circular letters. Emphasis was laid on breakfasts. A survey of 6,511 school children's breakfasts showed half to be inadequate.

Beware of Hollandaise Sauce

WITHIN the past few years Hollandaise sauce has been implicated in several outbreaks of food poisoning in Baltimore and elsewhere in the United States. Where investigated it was revealed in many instances that the sauce involved in the outbreaks contained bacteria which were capable of producing the offending toxin. Unlike some other forms of food poisoning it seems that this special type may appear at any season of the year, in warm weather or in cold.

Hollandaise sauce is one of the few

foods that can neither be successfully refrigerated to retard the growth of bacteria nor heated in order to kill off the organisms. This is because refrigeration hardens the butter in the sauce and causes it to become solid, while heating the sauce coagulates the eggs and causes the mixture to become lumpy. In either process the commodity is rendered unsuitable for serving, so that this product needs to be eaten very promptly after it is made. . . . —*Baltimore Health News*, Baltimore Health Department, April, 1938.

A Tabular Outline for Use in Reporting Hospital Morbidity*

JOSEPH BERKSON, M.D., F.A.P.H.A.

*Division of Biometry and Medical Statistics, The Mayo Clinic,
Rochester, Minn.*

ESSENTIAL to any comprehensive system of keeping account of diagnoses in the record rooms of hospitals is provision for a tabular summary of such diagnoses, of the sort that may be made for annual reports. In a previous article¹ I discussed the relationship of this function to other purposes which must be considered, and described a scheme for adapting the whole system to punch cards. Here I shall deal only with an amplification of that part of the subject which deals with the matter of the enumeration of diagnoses in tabular form.

Much discussion of the question of indexing medical diagnoses is needlessly confused because of failure to distinguish between a number of different problems involved. There is, for instance, the consideration of "nomenclature." Whether a pathologic condition should be called "pernicious anemia," "idiopathic anemia," "hyperchromic microcytic anemia," or "Addison's disease"; whether another condition shall be designated "melanotic carcinoma," "melanotic sarcoma" or "melanoma"; whether, "lymphadenitis" is an acceptable term—are all important questions in relation to the science of

nosology. They are not essential, however, if the task is that of enumerating the individuals suffering from those conditions. There is, again, the subject of *classification* of disease, which also is not a central consideration for the systematic enumeration of diagnoses. Classification is a *scientific* enterprise which proceeds in strictly logical fashion according to some defined, descriptive principle (e.g., "anatomic," "etiologic," "symptomatic"). It deals essentially with the abstract concepts of diseases rather than what is observed in individuals who are subject to them. The disease entity "carcinoma" may be logically divisible into the classes adenocarcinoma and epithelioma; and so far as the science of taxonomy is concerned, these two mutually exclusive classes may be exhaustive. But for statistical enumeration, there will have to be a place for patients with the diagnosis of "carcinoma" (*i.e.*, unknown with regard to whether glandular or epithelial) as well as for "neoplasm" (*i.e.*, unknown with regard to whether carcinoma or sarcoma). On the other hand, for purposes of enumeration a single principle in the ordering of the tabular categories is not a *sine qua non*.

These rather elementary observations are made to forestall hundreds of questions that one may hear discussed when the indexing of diagnoses is the subject;

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

but they do *not* concern us here and it will be well to exclude them explicitly from our present consideration.

What we *are* concerned with is the practical problem of providing an outline in terms of which an enumeration of diagnoses can be made and one that will be satisfactory for *statistical* purposes. A list of rubrics which will be satisfactory in that sense should have certain characteristics: (1) The individual rubrics should be sufficiently broad to make possible the assignment of diagnoses, even if not made with great refinement, yet narrow enough to be usefully discriminating. (2) The number of such rubrics or classes should be reasonably short.

Bolduan has discussed the value that a uniform system of reporting hospital morbidity might have for enlightening questions of interest to public health. In the Division of Biometry and Medical Statistics of The Mayo Clinic we have for the last several years struggled with the problem, with the practical objective of providing a tabular outline that would furnish a reasonably simple and consistent statement of the diagnoses made annually. After considerable experimentation we decided to use as a basis for our outline the *International List of Diseases and Causes of Death*,³ for the reason that that set of rubrics has the widest current use for purposes of statistical enumeration.* However, since our aim was to report morbidity, not mortality, it was necessary to modify it. Certain of the entries in the *International List* refer necessarily only to deaths such as "homicide" and "violent deaths." Other entries had to be changed because they were not as clear or specific

as necessary. In still other cases, when the entries of mortality were translated into diagnoses of morbidity there resulted an overlapping of designations. We therefore modified the entries, but in doing this we proceeded on the principle that the original arrangement and designations be disturbed as little as possible, and in each instance only for definite reasons. In this way we hoped to preserve, so far as was possible and consistent with the purposes in hand, the facility of comparing statistics of morbidity with statistics of mortality, as reported in terms of the *International List*. Yet, for our list a rather considerable number of modifications had to be made. We have now used this set of rubrics for the tabulation of the experience of three successive years, and more than 300,000 diagnoses have been assigned according to it. Yet it is not to be considered as a finished product. In response to repeated requests we are publishing this list now and it is to be hoped that it will be tried by a number of representative hospitals. It would be highly desirable if the experiences of different hospitals were accumulated and from the assembled experience a list to be developed which could be adopted as standard.

The set of rubrics is given in Table I, together with code numbers which can be used in a three-column punch card code or which can be translated into a single-column multiple-punch code. It will be noted that unused numbers are interspersed liberally in the code for additional entries. In parentheses to the right of the entries are given the numbers of the *International List*⁴ which correspond to the rubrics of The Mayo Clinic List. Since a number of the classes of the *International List* have been considerably subdivided and rearranged, various of The Mayo Clinic rubrics correspond to particular diagnoses that may be found in several rubrics of the *Inter-*

* Other individuals, I am aware, have made up similar lists. Specifically, Selwyn D. Collins of the U. S. Public Health Service has used a list, which is a modification of the *International List of Causes of Death*, for the summarizing of morbidity surveys. But the List of The Mayo Clinic is specifically adapted to hospital morbidity, and moreover has had a trial for several successive years.

national List. The outline is not, of course, a list of diagnoses but a list of rubrics into which diagnoses are fitted, though in particular places a rubric may correspond to a single specific diagnosis. It is essentially a statistical and practical instrument, not a guide for scientific diagnosis or an authority for proper medical nomenclature. In practical application there

is used in conjunction with the outline of rubrics an index of diagnoses. Here are arranged, alphabetically, detailed diagnoses with the code numbers corresponding to the rubrics to which they belong, and in this index are incorporated decisions as to the disposition of diagnoses which, from a consideration of the outline alone, would be equivocal.

TABLE I

*Tabular Outline of Rubrics for General Morbidity Reports in Hospitals,
Mayo Clinic, Rochester, Minn.*

I. INFECTIOUS AND PARASITIC DISEASES

Mayo
Clinic
Code

- 002 Typhoid fever (1)
- 003 Paratyphoid fever (2)
- 004 Typhus fever (3)
- 005 Relapsing fever (4)
- 006 Undulant fever (5)
- 007 Smallpox (6)
- 008 Measles (7)
- 009 Scarlet fever (8)
- 010 Whooping cough (9)
- 011 Diphtheria (10)
- 012 Influenza (respiratory) (11a)
- 013 Cholera (12)
- 014 Dysentery, amebic (13a)
- 015 Dysentery, bacillary (13b, c)
- 016 Plague (14)
- 017 Erysipelas (15)
- 020 Acute poliomyelitis and acute polioencephalitis (16)
- 021 Lethargic or epidemic encephalitis (17)
- 024 Glanders (19)
- 025 Anthrax (*Bacillus anthracis*) malignant pustule (20)
- 026 Rabies (21)
- 027 Tetanus (22)
- 030 Tuberculosis, respiratory system (23)
- 032 Tuberculosis, meninges and central nervous system (24)
- 035 Tuberculosis, gastro-intestinal tract (25, 31)
- 037 Tuberculosis, vertebral column (26)
- 040 Tuberculosis, bones, except vertebral column (27a)
- 042 Tuberculosis, joints, except vertebral column (27b)
- 045 Tuberculosis, skin (28)
- 047 Tuberculosis, genito-urinary system, male (30)
- 048 Tuberculosis, genito-urinary system, female (30)
- 050 Tuberculosis, eye (31)
- 052. Tuberculosis, e.e.e.* (29, 31, 32)
- 055 Leprosy (33)
- 065 Syphilis, primary (34)
- 075 Syphilis, secondary (34)
- 080 Syphilis, tertiary, skin (34)
- 081 Syphilis, tertiary, vascular (34)
- 082 Syphilis, tertiary, eye (34)
- 083 Syphilis, tertiary, bone (34)
- 084 Syphilis, tertiary, central nervous system, e.e.e. (34)
- 085 Syphilis, tertiary, e.e.e. (34)
- 095 Syphilis, congenital (34)
- 105 Syphilis investigated, serology positive (34)

- 106 Syphilis, e.e.e. (34)
- 112 Gonococcus infection, joints (35)
- 113 Gonococcus infection, genito-urinary organs, male (35)
- 114 Gonococcus infection, genito-urinary organs, female (35)
- 115 Gonococcus infection, eye (35)
- 116 Gonococcus infection, e.e.e. (35)
- 121 Venereal disease, e.e.e. (35)
- 123 Septicemia (36)
- 126 Yellow fever (37)
- 127 Malaria (38)
- 132 Diseases due to protozoal parasites, e.e.e. (39)
- 134 Ankylostomiasis (40)
- 137 Hydatid cysts (41)
- 140 Diseases caused by helminths, e.e.e. (42)
- 141 Actinomycosis (43)
- 145 Mycoses, e.e.e. (43)
- 146 Chickenpox (44a)
- 147 German measles (44b)
- 148 Mumps (44c)
- 152 Infectious and parasitic diseases, e.e.e. (44c)

II. NEOPLASMS

- 154 Neoplasm, malignant, lip, (45)
- 156 Neoplasm, malignant, tongue (45)
- 159 Neoplasm, malignant, salivary glands (45)
- 162 Neoplasm, malignant, buccal cavity and pharynx, e.e.e. (45)
- 165 Neoplasm, malignant, esophagus (46)
- 169 Neoplasm, malignant, stomach (46)
- 172 Neoplasm, malignant, small intestine (46)
- 175 Neoplasm, malignant, large intestine, except rectum (46)
- 177 Neoplasm, malignant, rectum (46)
- 180 Carcinomatosis, abdominal (46)
- 183 Neoplasm, malignant, pancreas (46)
- 185 Neoplasm, malignant, gallbladder and ducts (46)
- 188 Neoplasm, malignant, liver (46)
- 193 Neoplasm, respiratory system (47)
- 196 Neoplasm, malignant, uterus (48)
- 199 Neoplasm, malignant, ovary (49)
- 202 Neoplasm, malignant, genito-urinary organs, female, e.e.e. (49, 53)
- 205 Neoplasm, malignant, breast (50)
- 210 Neoplasm, malignant, testicle (51)
- 213 Neoplasm, malignant, prostate (51)
- 216 Neoplasm, malignant, adrenal gland (51, 53)
- 219 Neoplasm, malignant, thymus (51, 53)
- 221 Neoplasm, malignant, thymus (51, 53)
- 224 Neoplasm, malignant, genito-urinary organs, male, e.e.e. (51)
- 227 Neoplasm, malignant, skin, e.e.e. (52)
- 230 Neoplasm, pituitary (53, 54, 55)

* e.e.e. means except elsewhere enumerated.

- 232 Neoplasm, brain, including cranial nerves, e.e.c. (53, 54d, 55d)
 235 Neoplasm, spinal cord (53, 54e, 55e)
 237 Sarcoma, bone, any part of body (53)
 244 Hemangio-endothelioma and Lymphangio-endothelioma, except brain or spinal cord (53)
 247 Neoplasm, malignant, thyroid (53)
 250 Neoplasm, eyeball and orbit (53, 54e, 55e)
 255 Melanocarcinoma, e.e.c. (53)
 257 Neoplasm, malignant, e.e.c. (53)
 263 Fibroma, uterus (54b)
 268 Endometrioma (54b, c)
 271 Polyp, female genital tract (54b, c)
 274 Neoplasm, nonmalignant, abdominal or pelvic, female, e.e.c. (54b, 55b)
 276 Adenoma, prostate (137)
 278 Neoplasm, nonmalignant, skin (54e)
 279 Lipoma (54e)
 281 Hemangioma and lymphangioma (54e)
 287 Neoplasm, nonmalignant, bone (54e)
 290 Neoplasm, nonmalignant, breast (54e)
 295 Polyp, gastro-intestinal tract (54e)
 298 Polyp, nose (54e)
 299 Neoplasm, nonmalignant, respiratory system, e.e.c. (54e)
 300 Von Recklinghausen's disease (neurofibromatosis) (54e)
 303 Neoplasm, nonmalignant, nerve, e.e.c. (54e)
 306 Neoplasm, e.e.c. (53, 54e, 55e)
 310 Neoplasm, follow-up examination

III. RHEUMATIC DISEASES, NUTRITIONAL DISEASES, DISEASES OF THE ENDOCRINE GLANDS, AND OTHER GENERAL DISEASES

- 312 Acute Rheumatic fever (56)
 317 Rheumatism, e.e.c. (57)
 320 Gout (58)
 322 Diabetes mellitus (59)
 325 Diabetes, e.e.c. (69)
 327 Scurvy (60)
 330 Beriberi (61)
 332 Pellagra (62)
 335 Rickets (63)
 340 Acromegaly, without pituitary tumor specified (65)
 342 Hypopituitarism (65)
 345 Diseases of the pituitary body, e.e.c. (65)
 348 Adenoma, toxic, thyroid (66a)
 349 Adenoma, nontoxic, thyroid (66a)
 350 Exophthalmic goiter (66b)
 353 Goiter, e.e.c. (66e)
 355 Myxedema (66c)
 358 Cretinism (66c)
 361 Tetany, parathyroid (66d)
 363 Tetany, e.e.c. (66d)
 366 Diseases of the thyroid and parathyroid glands, e.e.c. (66e)
 371 Addison's disease (31, 68)
 373 Dysfunction, ovarian (139b)
 375 Endocrine disturbances, e.e.c. (69)
 376 Obesity (69)

IV. DISEASES OF THE BLOOD AND BLOOD-MAKING ORGANS

- 377 Purpura (70a)
 380 Hemophilia (70b)
 382 Pernicious anemia (71a)
 388 Anemia, e.e.c. (71b)
 391 Leukemia (72a)
 393 Lymphosarcoma (72b)
 396 Hodgkin's disease (72b)
 399 Banti's disease (73)
 404 Diseases of the spleen, e.e.c. (73)
 407 Polycythemia vera (74)
 410 Actinobacillosis (74)
 413 Diseases of the blood and blood-making organs, e.e.c. (74)

V. POISONINGS AND INTOXICATIONS

- 416 Alcoholism (75)
 418 Poisoning, by inhalation gas (178)
 423 Poisoning, lead (77a)
 425 Poisoning, e.e.c. (77b, c)

VI. DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE

- 428 Encephalitis, e.e.c. (78)
 430 Abscess, brain (78)
 433 Meningitis, e.e.c. (18, 79a, b)
 436 Progressive locomotor ataxia (tabes dorsalis) (80)
 439 Charcot joint (80)
 442 Amyotrophic lateral sclerosis and combined sclerosis (81)
 445 Progressive muscular atrophy (81)
 448 Progressive muscular dystrophy (81)
 451 Syringomyelia (not associated with tumor) (81)
 454 Multiple sclerosis (87b)
 457 Friedrich's ataxia (81)
 459 Ataxia, Marie's (81)
 462 Paralysis and other residuals of cerebral hemorrhage (82a)
 466 Paralysis, central nervous system, e.e.c. (87b)
 470 Paralysis, peripheral nerves (87b)
 472 Diseases of the Spinal Cord and Brain, e.e.c. (81)
 475 Aneurysm, brain (96)
 478 Cerebral embolism and thrombosis, acute, e.e.c. (82b)
 481 General paralysis of the insane (83)
 483 Dementia praecox and other psychoses (84, 87b)
 486 Neuroses, minor (functional complaints) (87b)
 489 Epilepsy, except Jacksonian (85)
 491 Trigeminal neuralgia (87a)
 492 Paralysis, facial (82d)
 493 Paralysis, cranial nerves, e.e.c. (82d)
 494 Neuralgia and neuritis, e.e.c. (87a)
 497 Chorea, Huntington's (87b)
 499 Chorea, except Huntington's (87b)
 505 Idiocy (87b)
 507 Migraine (87b)
 511 Diseases of the nervous system, e.e.c. (86, 87b)
 515 Glaucoma (88)
 517 Cataract (88)
 520 Amaurosis (88)
 523 Trachoma (88)
 525 Errors of refraction (88)
 527 Diseases of the organs of vision, e.e.c. (88)
 529 Otitis media (89a)
 530 Deafness (87b, 89a)
 532 Ménière's disease (89a)
 535 Diseases of the ear, e.e.c. (89a)
 538 Diseases of the mastoid process (89b)

VII. DISEASES OF THE CIRCULATORY SYSTEM

- 542 Rheumatic heart disease (56, 92, 93, 95b)
 545 Hypertensive heart disease (95b)
 548 Subacute bacterial endocarditis (92a)
 550 Angina pectoris (94a)
 551 Coronary embolism and thrombosis (94b)
 553 Diseases of the heart, e.e.c. (90, 91, 92, 93, 94, 95)
 555 Vascular aneurysm, e.e.c. (96)
 558 Arteriosclerosis, e.e.c. (97)
 563 Raynaud's disease (98)
 566 Thrombo-angiitis (99)
 568 Diseases of the arteries, e.e.c. (99)
 571 Phlebitis (100)
 573 Hemorrhoids (100)
 576 Varicose veins (100)
 578 Diseases of the veins, e.e.c. (100)
 581 Lymphangitis (101)
 583 Hypertension, essential (102)
 586 Hypertension, e.e.c. (102)
 588 Anomalies of the blood pressure, e.e.c. (102)
 592 Diseases of the Circulatory system, e.e.c. (103)

VIII. DISEASES OF THE RESPIRATORY SYSTEM

- 595 Rhinitis, vasomotor (104a)
- 598 Rhinitis, except vasomotor (104a)
- 601 Diseases of the nasal fossae and annexa, e.e.e. (104)
- 603 Sinusitis (104b)
- 605 Laryngitis (105)
- 608 Diseases of the larynx, e.e.e. (105)
- 610 Bronchitis (106)
- 613 Bronchopneumonia (107a)
- 615 Lobar pneumonia (108)
- 619 Pneumonia, e.e.e. (109)
- 622 Pleurisy (110)
- 624 Pulmonary embolism and thrombosis (111a)
- 627 Pulmonary edema (111b)
- 629 Asthma (112)
- 631 Pulmonary emphysema (113)
- 634 Abscess, lung (114b)
- 637 Diseases of the respiratory system, e.e.e. (114a, 114b)

IX. DISEASES OF THE DIGESTIVE SYSTEM

- 640 Vincent's angina (115a)
- 643 Tonsillitis (115a)
- 646 Diseases of the pharynx, e.e.e. (115a)
- 648 Infected or impacted teeth (115b)
- 649 Parotitis, e.e.e. (115c)
- 653 Diseases of the buccal cavity and annexa and lip, e.e.e. (115b)
- 655 Stricture, esophagus (116)
- 657 Diverticulum, esophagus (116)
- 660 Diseases of the esophagus, e.e.e. (116)
- 662 Ulcer, stomach (117a)
- 664 Ulcer, duodenum (117b)
- 666 Ulcer, jejunum (123)
- 668 Peptic ulcer, not specified as to location (123)
- 670 Dyspepsia (118)
- 673 Cardiospasm (118)
- 675 Diseases of the stomach, e.e.e. (118)
- 678 Colitis, ulcerative (120)
- 681 Diarrhea and enteritis, e.e.e. (119, 120)
- 684 Appendicitis (121)
- 687 Hernia, inguinal (122a)
- 689 Hernia, abdominal (122a)
- 692 Hernia, diaphragmatic (122a)
- 694 Hernia, femoral (122a)
- 697 Hernia, vaginal (122a)
- 701 Hernia, intestinal, e.e.e. (122a)
- 703 Diseases of the anus and rectum, e.e.e. (123)
- 706 Intestinal obstruction (122b)
- 710 Diseases of the intestines, e.e.e. (123)
- 712 Cirrhosis of the liver, specified as alcoholic (124a)
- 715 Cirrhosis of the liver, not specified as alcoholic (124b)
- 717 Yellow atrophy of the liver (125a)
- 720 Diseases of the liver, e.e.e. (125b)
- 722 Biliary calculus (126)
- 725 Cholecystitis (127)
- 729 Diseases of the gallbladder and biliary passages, e.e.e. (127)
- 731 Diseases of the pancreas, e.e.e. (128)
- 734 Peritonitis, e.e.e. (129)
- 736 Subphrenic abscess (129)

X. DISEASES OF THE GENITO-URINARY SYSTEM

- 744 Nephritis, e.e.e. (130, 131, 132)
- 746 Displaced kidney (133)
- 749 Purulent infection, kidney (133)
- 751 Polycystic kidney (133)
- 755 Diseases of the kidneys and ureters, e.e.e. (133)
- 756 Renal calculus (134)
- 758 Ureteral calculus (134)
- 761 Vesical calculus (134)
- 767 Cystitis (135)
- 770 Fistula, bladder (135)

- 774 Diseases of the bladder, e.e.e. (135)
- 776 Stricture, urethra (136a)
- 780 Diseases of the urethra, e.e.e. (136b)
- 781 Diseases of the urinary system, e.e.e. (136b)
- 782 Calculus, prostate (137)
- 786 Prostatitis (137)
- 788 Diseases of the prostate, e.e.e. (137)
- 791 Orchitis (138)
- 796 Diseases of the male genital organs, e.e.e. (138)
- 805 Diseases of the ovaries and diseases of the tubes and parametrium, e.e.e. (139a, b, c, e)
- 807 Conditions of endometrium, e.e.e. (139c)
- 810 Malposition, pelvic organs, female (139c)
- 816 Multiple pelvic diseases, female (139a, b, c, e)
- 820 Diseases of the uterus, e.e.e. (139c)
- 821 Menopause (139c)
- 825 Mastitis (139d)
- 829 Nonpuerperal diseases of the breast, e.e.e. (139d)
- 831 Vaginitis (139e)
- 835 Diseases of the female genital organs, e.e.e. (139c)

XI. DISEASES AND CONDITIONS OF PREGNANCY, CHILDBIRTH AND PUERPERAL STATE

- 838 Abortion (140, 141)
- 843 Ectopic pregnancy (142a, b)
- 847 Pregnancy, e.e.e., with parturition here (143)
- 848 Pregnancy, e.e.e., with parturition elsewhere (143)
- 851 Placenta praevia (144a)
- 853 Puerperal Hemorrhages, e.e.e. (144b)
- 855 Puerperal septicemia and pyemia (145a)
- 858 Eclampsia (146)
- 860 Toxemia of pregnancy, e.e.e. (147)
- 863 Puerperal phlegmasia alba dolens, embolus, or phlebitis (148)
- 865 Conditions of the puerperal state, e.e.e. (145b, 150)

XII. DISEASES OF THE SKIN

- 868 Furuncle, carbuncle, acute inflammation skin (151, 152)
- 873 Herpes (153)
- 875 Pemphigus (153)
- 878 Scleroderma (153)
- 882 Diseases of the skin, e.e.e. (153)

XIII. DISEASES OF THE BONES AND ORGANS OF LOCOMOTION

- 885 Osteomyelitis (154)
- 887 Paget's disease, bone (155)
- 890 Fracture, acute, skull (194b)
- 894 Fracture, acute, bone, e.e.e. (194b)
- 895 Fracture, old, any bone (155)
- 905 Diseases of the bones, e.e.e. (155)
- 908 Arthritis, e.e.e. (155a)
- 910 Dislocation, joint (156a)
- 913 Sacro-iliac disease (155a)
- 916 Diseases of the joints, e.e.e. (156a)
- 918 Myasthenia gravis (156b)
- 921 Bursitis (156b)
- 925 Myositis ossificans (156b)
- 926 Talipes, acquired (156b)
- 928 Torticollis (156b)
- 931 Dupuytren's contracture (156b)
- 935 Diseases of the organs of locomotion, e.e.e. (156b)

XIV. CONGENITAL MALFORMATIONS

- 938 Hydrocephalus (157a)
- 939 Spina bifida and meningocele (157b)
- 943 Congenital malformations of the heart (157c)
- 945 Branchial cyst (157d)

- 948 Congenital talipes (157d)
- 950 Harelip (157d)
- 953 Hirschprung's disease (157d)
- 955 Hypospadias (157d)
- 956 Undescended testicle (157d)
- 957 Congenital malformations, genito-urinary system, e.e.e. (157d)
- 958 Imperforate anus (157d)
- 961 Congenital defects, e.e.e. (157d)

XV. DISEASES AND CONDITIONS OF EARLY INFANCY

- 963 Normal birth
- 965 Premature birth (159)
- 966 Stillbirth
- 967 Injury at birth, in new born (160)
- 969 Atelectasis, in new born (161a)
- 971 Icterus of the new born (161b)
- 974 Diseases peculiar to early infancy, e.e.e. (158, 161c, d)

XVI. SENILITY

- 976 Senility (162)

XVII. INJURIES

- 986 Injuries by animals (176, 188)
- 988 Injuries, acute, e.e.e. (184-214)
- 989 Injuries, old (posttraumatic and postsurgical conditions included)
- 990 Foreign body, bronchus or digestive tract, including larynx and lung (194a)
- 992 Foreign body, e.e.e. (194a)

XVIII. MISCELLANEOUS

- 994 Follow-up examination, postoperative, except neoplasm-310
- 995 Diseases, e.e.e. (69)
- 996 Hospital investigation
- 997 Negative general examination
- 998 No diagnosis or incomplete examination
- 999 Confidential file

TABLE II
General Summary
Diagnoses in 1936
Total Patients 65,097

Diagnoses	Patients			
	Total	Non-Surgical		Surgical
		Out Patient	Hos-pital	
I Infectious and Parasitic Diseases				
Typhoid fever	2		2	
Paratyphoid fever	2	2		
Undulant fever	19	13	6	
Measles	8	8		
Scarlet fever	49	28	21	
Whooping cough	17	17		
Diphtheria	3		3	
VII Diseases of the Circulatory System				
Rheumatic heart disease	251	212	36	3
Hypertensive heart disease	674	434	237	3
Subacute bacterial endocarditis	21	6	14	1
Angina pectoris	734	636	97	1
XVIII Miscellaneous				
Check-up examination, post-operative, except neoplasm	989	898	37	54
Diseases, e. e. enumerated	2,017	1,703	177	137
Hospital investigation	751		626	125
Negative general examination	1,702	1,702		
No diagnosis or incomplete examination	2,847	2,847		

In making our reports we do not attempt to select from among several simultaneous diagnoses a single "primary" one to be reported, but the same diagnosis is not assigned more than once to a particular patient in any one year, regardless of the number of visits or hospitalizations. In principle there is no limit to the number of simultaneous different diagnoses that may be enumerated; in practice, comparatively trivial diagnoses are not reported and overlapping diagnoses are combined into unit diagnoses referable to a single, definite condition. The cases in each rubric are reported in terms of the total number of patients,

and, of these, the number of out-patients, the number hospitalized surgically, and those hospitalized non-surgically. The form of a report is given in Table II.

REFERENCES

1. Berkson, Joseph. A System of Codification of Medical Diagnoses for Application to Punch Cards, with a Plan of Operation. *A.J.P.H.*, 26:606-612 (June), 1936.
2. Bolduan, C. F. Compiling Morbidity Statistics: a Fertile Field for Hospital Executives. *Mod. Hosp.*, 45:37-39 (Aug.), 1935.
3. Commission internationale pour la revision décennale des nomenclatures internationales des maladies (causes de décès, causes d'incapacité de travail) devant servir à l'établissement des statistiques nosologiques (classification Bertillon): Quatrième session, 16-19 Octobre, 1929. Paris, Imprimerie nationale, 1930, 223 pp.
4. *Manual of the International List of Causes of Death*, 1929. Washington, Gov. Print. Press, 1931, 342 pp.

Nursing Service Honored

AT the opening session of the National Nursing Biennial Convention, held in the Municipal Auditorium, Kansas City, Mo., April 25, the Walter Burns Saunders Memorial Medal was presented to Helen McDonough, of Pittsburgh, Pa., Chairman of the Private Duty Section of the American Nurses' Association, as representative of all bedside nurses. Dr. Loyal Davis, professor of surgery at North Western University Medical

School, Chicago, Ill., made the award.

The recipient of the medal is decided upon by a Committee of Awards, composed of the presidents of the three national nursing organizations—the American Nurses' Association, the National League of Nursing Education, and the National Organization for Public Health Nursing—and of W. L. Saunders of Philadelphia, in memory of whose father the medal is presented at each Biennial Nursing Convention.

The Acute Diarrheal Disorders*

A. V. HARDY, M.D., DR.P.H., AND JAMES WATT, M.D.

*U. S. Public Health Service, the Indian Medical Service, and the
DeLamar Institute of Public Health, Columbia University,
New York, N. Y.*

OUR anxieties and activities as public health workers appear to be the product of two influences—public concern vigorously expressed, and our own convictions as to the relative importance of various problems. For the former reason epidemic diarrheal diseases demand our attention. The outbreaks are explosive in character, often widely distributed, and the ailments are distressing. A satisfactory explanation and effective preventive measures are demanded. Under these circumstances there is but slight consolation in the knowledge that the epidemic diarrheal disorders are commonly of short duration and rarely hazardous to life. We are, and we must be, concerned with these outbreaks, but we must also evaluate accurately the relative importance of the epidemic and endemic diarrheal disorders.

The study which provides much of the data of this report is being conducted in Bernalillo County, N. M., and adjacent Indian communities, an area with an estimated population of 55,000. During July and August, 1937, there occurred among infants and young children within this region 57 reported deaths from the acute diarrheal disorders. This represents the results of

an endemic disease. Though such a high incidence of these conditions is unusual in this country, it remains true that in 1934 a total of 26,584 deaths in the United States were attributed to "diarrhea and enteritis" and "dysentery." Further, it is readily established that for each fatality there occur several severe cases of non-fatal diarrheal disease in the young or aged, and an even larger number of milder disorders involving older children and younger adults.

Though varying widely in frequency, these are disorders familiar to all areas. They warrant and should now receive the same persistent interest and attention which has already been given with such gratifying effect to typhoid fever.

CLINICAL CONSIDERATIONS

For general clinical purposes the diarrheal diseases may be separated into two groups, those due to proliferative and non-proliferative agents; that is, the infectious and non-infectious disorders. If the latter result from a single ingestion of irritating substance, the condition will persist only for the few hours necessary to evacuate the intestinal tract. The severity will be dependent upon the magnitude of the dose of offending material. The familiar member of this group is staphylococcal food poisoning. Occasionally there is a repeated ingestion of small doses of

* Read before a Joint Session of the Public Health Engineering and Epidemiology Sections of the American Public Health Association at the Sixty-sixth Annual Meeting, October 7, 1937.

toxic material. Clinically these cases can be identified with difficulty, if at all. In outbreaks of this type the diagnostic problem rests chiefly with the epidemiologist. Other varieties of non-infectious diarrheas tend to be milder but more persistent. These may be dependent on dietary factors, as the daily ingestion of excessive carbohydrates by infants and excessive roughage by adults. Constitutional influences may also be concerned—allergic idiosyncrasies, psychic or neurological instabilities, or structural abnormalities. These are the concern of the practising physician whose duty it is to study the peculiar needs of single individuals. No further attention will be given at this time to these clinical entities.

For purposes of this discussion, the infectious diarrheas are defined as those due to the presence and multiplication of microorganisms within the lumen or wall of the intestinal tract. Whether these produce damage by the elaboration of toxic products or by parasitic growth in or on the walls of the tract is of secondary importance. Clinically these disorders tend to begin rather suddenly. The healthy individual as a rule first notes mild abdominal distress followed in a few hours by frequent evacuations and increasing pain. The temperature may or may not become elevated. The stools may or may not become bloodstained. Pus cells may usually be observed but are not always present. In severity and course these disorders are most variable. They may be merely transient and mild annoyances, they may run a stormy and protracted course, or they may be fulminating fatal illnesses.

The differential clinical diagnosis of the diarrheal disorders presents unusual difficulties. There is but one outstanding symptom—diarrhea—and this may arise from a wide variety of causes. The associated complaints, such as

nausea, vomiting, and abdominal pain, are few and have practically no differential value. Physical examination usually reveals little other than the signs of dehydration and some abdominal tenderness. Of some diagnostic significance are the temperature and character of the evacuations, but even these provide uncertain evidence as to etiology. In studying series of cases, the clinical course of the disease and the epidemiological observations provide indications valuable for diagnosis. Utilizing all of these data, we have concluded that the greater proportion, well over 90 per cent, of diarrheal disorders observed in our studies were acute enteric infections. Further than this it was impossible to go without the evidence presented by laboratory studies.

In considering the usual clinical classification and descriptions of the diarrheal diseases, it must be remembered that heretofore with few exceptions only cases severe enough to be hospitalized have been examined etiologically. Thus it has come about that bacillary dysentery has been observed as a serious disease characterized by sudden onset, with fever, abdominal pains, and the frequent passage of bloody muco-purulent stools. Field studies involving the etiological examination of diarrheas of all degrees of severity rapidly reveal an amazing variability in the clinical manifestations of bacillary dysentery, as is also true in amebiasis. The common error of the past has been to consider specific infections only in severer diarrheal disorders. We must carefully avoid this mistake in future.

ETIOLOGICAL STUDIES

That diagnostic laboratory studies of the diarrheal diseases have a proper and important place in the public health program has been both demonstrated and stated by several workers. For various reasons this remains a procedure

called for but infrequently and advocated but rarely. As illustrative of the productiveness of these examinations, let us state our own experience in the study in New Mexico. The positive findings reported include only the already identified strains. It is expected that the further study of additional and less typical organisms will increase somewhat the proportion of positives.

In the first 1,000 stool specimens examined culturally following July 1, 1937, 398 were submitted for the diagnosis of diarrheal disorders. The remainder were studied for epidemiological reasons. Of the diagnostic specimens, 147 (36.9 per cent) yielded organisms of the genus *Shigella*. Excluding cases in which but one stool was submitted and found to be negative, we examined for diagnostic purposes during July and August a total of 192 persons. From 128 (62.5 per cent) of these, *S. dysenteriae* were isolated. Further, of 22 fatal cases studied during the same period, 17 (77.3 per cent) yielded *S. dysenteriae*. Only 3 of the 5 negative fatal cases had as many as the minimum of 3 specimens considered essential for reasonably reliable diagnosis. Any test for a communicable disease which yields this proportion of positives, or even much less, is amply justified.

That stool cultures for diarrheal disorders are productive is clearly apparent, but even more evident are the difficulties involved in a satisfactory application of this procedure. Here we have to deal not with one organism of relatively constant characteristics, as in typhoid fever, but at least two families of organisms, the *Shigella* and *Salmonella*, each with several members varying in type, and with many strains readily tending to reveal varying characteristics in different environments.

We have already found that there is unusual importance in the selection of laboratory procedures. During 1936,

we employed our then favorite medium, eosin-methylene-blue agar. Due to a limited supply of glassware we were restricted to 2 plates per specimen. This year we added 3 other differential media, using now a total of 4 plates per specimen. The proportion of positives found among diagnostic specimens has been more than doubled with a resulting increase of more than 50 per cent in the proportion of positive cases. A small part of this change may possibly be attributed to the influence of experience. A little more may be due to the fact that in 1936 few other cases than those in infants were examined, whereas in 1937 a number of illnesses in adults were reported and usually found positive for *S. dysenteriae*. That these influences are of negligible importance seems apparent since in 114 (57 per cent) of the first 200 positive specimens this year the organisms were found only on 2 of the types of media newly employed. By far the best results have been obtained on desoxycholate citrate agar. This yielded the organisms in 166 (83 per cent) of the 200 positives. The proportions of the other 3 media which yielded positives were plain desoxycholate agar, 33.7 per cent, Endo's agar 30.2 per cent, and eosin-methylene-blue agar 26.5 per cent. The relative value of these media for the isolation of the Sonne variety of *S. dysenteriae* is not yet reliably indicated in our study, but even for this the desoxycholate citrate agar apparently yields quite as good results as the other media employed. The importance of selecting the best laboratory procedures available is evident. Is it not also likely that further advances in the study of the diarrheal diseases may be made if technics are examined critically and revised or devised specifically for these disorders?

That the Flexner and Sonne varieties of *S. dysenteriae* are the major cause of the acute diarrhea in this country

has been as certainly demonstrated in other areas as in New Mexico—for example, in Henrico County, Va., by McGinnis,¹ and in Los Angeles by Kessel.² It seems equally clear that other organisms do give rise to infectious diarrhea.* Occasionally we have been able to incriminate one of the *Salmonella* group and very rarely *Eberthella typhi*. It seems probable that still other organisms are involved but definite incriminating evidence is difficult to obtain and continues to be lacking.

That the etiology of the diarrheal diseases may vary as markedly in different areas, as does the incidence, seems possible. However, our own experience forces us to conclude that the most effective approach to these disorders is to use the best bacteriological methods available for the identification of specific etiological agents.

EPIDEMIOLOGICAL OBSERVATIONS

As illustrative of the methods employed and certain of the interesting observations in the epidemiological study of the acute diarrheal diseases, I am reporting a portion of a not yet completed study in a small village in New Mexico. Findings are somewhat unusual in the richness of the positive observations but conform in type to those in 3 other areas similarly studied.

Chilili is a relatively isolated Spanish speaking community with a summer population of 210 persons. The public health nurse visits the area once weekly. On August 20 she reported that she had found a baby aged 24 days very sick with acute diarrhea, and that 2 other infants were having milder symptoms, which had then persisted for almost a week. The inquiry had also revealed the recent occurrence of

mild diarrhea involving adults in 2 different families. Platings from a diaper brought to the laboratory revealed that the young infant had a *S. dysenteriae* infection. Hospitalization was refused, the course was rapidly downward, and the child died 3 days after first seen.

Inquiry in the 5 families from which cases of acute diarrhea had been reported revealed no common exposures or close relationships. However, a clear record of a communicable disease was given in the family with the fatal case of proven bacillary dysentery. A visiting grandmother had come from the home of a son where 2 adults had recently been troubled with diarrhea. She herself had a mild diarrhea on arrival. Within 10 days 4 of 5 adults and 2 (1 the fatal case) of 3 children had acquired the same disorder. The mother of the young infant was ill for 4 days and in bed for 2; the other adults and a child of 4 years made no complaint beyond the second day.

The people of this area had attained the reputation of being particularly coöperative with the Health Department. A detailed study seemed both promising and warranted. In undertaking this, the object was to collect complete records concerning the occurrence of diarrheal disorders, to obtain stool specimens from all or almost all of the people, and to make a house-to-house sanitary survey of the area. The stool specimens were willingly provided by a large majority of the people. Four families with histories of diarrhea (in 2 instances with proven cases of bacillary dysentery) found it too inconvenient to comply with our request, as did 6 others in which the people had been continuously well. In all, laboratory specimens were obtained from 155 individuals. Three of these were active clinical cases—all proved to be positive for *S. dysenteriae*. Of those who were well at the time of the

* Subsequent serological study of our isolated organisms revealed a substantial number of strains antigenically identical with Clayton and Warren's "Newcastle dysentery bacillus."

examination, 18 (11.6 per cent) yielded the same organism. Including the 3 cases, 20 of the 21 positives were within a delimited area which included about one-half of the residents of the village. These findings are to be compared with the more normal population groups, in which the carriers of *S. dysenteriae* are quite rare. Studies here are unfortunately too meager or uncertain to permit the statement of any numerical proportions.

It is apparent that in this village *S. dysenteriae* had infected a great many—substantially more than these positives which were found as a result of one test only. A further striking feature is that there existed the widest variation in the reaction by different individuals to the parasitic organisms. Adults were either undisturbed or had a mild diarrhea while some children were overcome with a severe, and in 2 instances fatal infection. Observation of severe cases alone would have produced no useful epidemiological evidence; observation of all cases, including the mild transient disorders, would have given a very incomplete picture; but a study of the whole population group did give an epidemiological picture which clearly indicated significant variations in incidence.

In formulating the epidemiological approach to the diarrheal disorders, the varying and usually mild pathogenicity of many of the etiological agents must be appreciated. We have to deal with a group of organisms near the borderline which separates the parasitic and saprophytic agents. Often they may and do assume the rôle of the latter, or at most they may be but mildly pathogenic. Occasionally in susceptible individuals their parasitic properties become fully evident. It is not the latter which we must seek to examine, but rather the spread and history of the organisms in all their relationships.

PREVENTION

A very simple experimental examination of preventive measures is now under way as a part of our studies in New Mexico. For this test a semi-rural area with a population of approximately 1,000 was selected, in which the incidence of acute diarrhea has been consistently high in recent summers. A representative sample of the inhabitants was also examined in 1936 and a relatively high incidence of carriers of *S. dysenteriae* was found. During the winter at public expense the universally insanitary privies were replaced by sanitary ones. Save for the incidental education concerning the maintenance and use of these, no other changes were made. It is safe only to comment that during the summer of 1937 the total incidence of diarrheal diseases was very low and that the carriers of *S. dysenteriae* had declined in number, though still numerous enough to permit ready spread of the specific infection in a favorable environment. Despite the optimism of families concerned and the physicians serving the area, judgment must be reserved. It is noteworthy, however, that no such decline has taken place in areas in which only a portion of the population had been provided with effective sanitary arrangements. Complete sanitation appears to provide effective protection while partial sanitation evidently has little value.

The incidence of typhoid fever has heretofore served as an index of the adequacy of sanitation. It is suggested that in the diarrheal disorders we have a more sensitive measure and the one which may well be commonly employed in the future.

SUMMARY

The prevention of mortality and morbidity from the acute diarrheal diseases remains an important public health problem.

Clinically these disorders may be classified with reasonable accuracy as non-infectious and infectious. The former are usually acute and of very short duration, or mild and quite chronic. The latter vary widely in manifestation. Clinical characteristics do not serve to separate reliably the *Shigella* infections from other infectious conditions.

Cultural studies are essential for reliable diagnosis. Success in this varies widely, depending in large measure on the differential media employed. Attention is called to the value of the desoxycholate citrate agar.

In epidemiological studies designed to determine the incidence or spread of these infections, it is essential that healthy individuals and those mildly ill be examined with the same interest and care as those severely ill.

The major problem in the prevention of the acute diarrheal disorders appears to be the more effective prevention of the dissemination of human excrement.

REFERENCES

1. McGinnis, G. F., McLean, A. L., Spindle, F., and Maxcy, K. F. Study of Diarrhea and Dysentery in Henrico County, Virginia. *Am. J. Hyg.*, 24:552:567 (Nov.), 1936.
2. Kessel, J. F., Blakeley, L., Cavell, K. Amebiasis and Bacillary Dysentery in Los Angeles County Hospital, 1929-1935. *Am. J. Trop. Med.*, 16:417:430 (July), 1936.

Carbolized Vaccine for Animal Bites

FOR bitten people treated by one or the other of two methods (carbolized vaccine or Pasteur's method) in 1933, with 100 as the standard, in 1934 there were 93.30 and for 1935 there were 81.10. For patients treated who were bitten by animals known to be rabid in 1933, with 100 as standard, there were 79.80 in 1934 and only 57.20 in 1935.

For the whole period of 3 years, among 5,918 patients treated, of whom 787 (13.20 per 100) were bitten by animals known to be rabid, there

were only 5 failures, 0.08 per 100.

The study of several types of anti-rabic vaccine have led to the conclusion that the carbolized vaccine has an indisputable superiority on account of the ease of preparation and of use, and also on account of the ease of transportation and its keeping qualities. It is the most economical and rarely causes local reactions in the persons treated.—Prof. Petragani, Protection Contra La Rage en Italie, *Office International D'Hygiene Publique*, Mar., 1938, p. 168.

A Water-Borne Outbreak of Gastroenteritis in a Tennessee Town*

CRIT PHARRIS, M.D., F. W. KITTRELL, AND
W. C. WILLIAMS, M.D., F.A.P.H.A.

State Department of Public Health, Nashville, Tenn.

LATE in the summer of 1936, it came to the attention of the State Health Department that an East Tennessee town of approximately 2,500 inhabitants was experiencing a moderately extensive epidemic of gastro-intestinal disorder and that similar outbreaks of variable severity had been experienced at irregular intervals for several years. The annoyance of repeated outbreaks had finally created sufficient public interest and concern to cause a request for an investigation. The extent and severity of previous outbreaks are unknown since epidemiological and morbidity data for previous years were not reliable.

Unfortunately, neither of the rather well defined outbreaks occurring in June and August, 1936, was reported until after each had practically subsided. The epidemiological approach was not unlike the usual procedure in an investigation of this type. The data included in this report were procured as a result of a house-to-house survey which was made of the entire town immediately after the last outbreak in August. Epidemiological, engineering, and laboratory personnel coöperated in this coördinated study.

The town has municipally owned and operated water and sewerage systems, which serve approximately 95 and 82 per cent, respectively, of the population. General economic, social, and public health conditions were considered fairly typical for a town of this size.

SURVEY FINDINGS

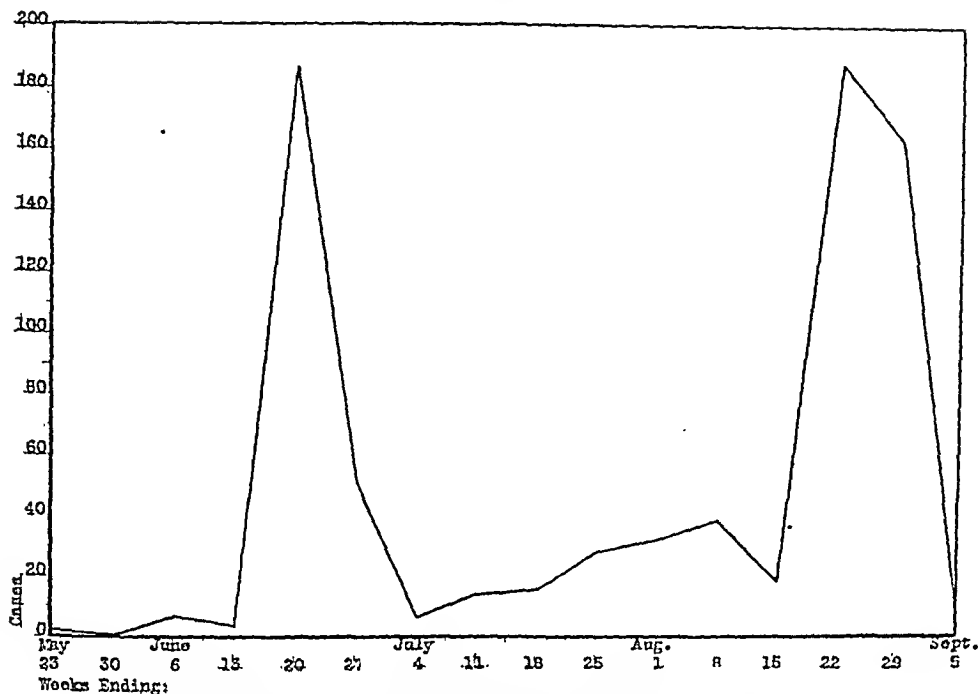
A. Epidemiological

A total of 765 persons, or approximately 31 per cent of the town's population, was found to have had one or more rather well defined attacks of gastroenteritis from May 16 to September 2, 1936. A small number of cases was excluded from the final summary because of the vagueness of symptoms or lack of information suitable for statistical analysis. The morbidity rate for a nearby town was found by actual survey to be 24 cases per 1,000 population as compared to a rate of 312 in the epidemic area. Only 17 clinical cases were found during the house-to-house survey. Efforts to isolate the probable causative organism from these cases were not successful.

More than 90 per cent of the cases gave a history of sudden onset with nausea, vomiting, and epigastric discomfort of variable degree and duration, usually lasting from 2 to 10 hours. The majority of cases gave a

* Read at a Joint Session of the Public Health Engineering and Epidemiology Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

CHART I



CASES OF GASTRO ENTERITIS IN A TENNESSEE TOWN, MAY 16 - SEPTEMBER 2, 1936

history of diarrhea, abdominal pain, distension and mild tenesmus within 4 to 10 hours after onset. These symptoms persisted from 2 to 6 days, depending largely upon the time treatment was begun. Some of the untreated cases reported the passage of small amounts of blood and mucus. Approximately 50 per cent gave a history of a slight elevation of temperature. Weakness was found to be directly proportionate to the severity of the symptoms. There were no reliable data indicating the formation of any degree of immunity against the offending agent, although there were some indications that the first attack was usually more severe than subsequent ones.

The case distribution was uniform throughout the urban and suburban areas receiving city water. Chart I shows the time distribution as determined by the survey. It is of more than passing interest that the peaks of the 3 major outbreaks occurred on Saturdays. We

can only surmise the probable explanation of this phenomenon. Although the survey was discontinued early in September it was later learned that of the 179 students in a local private school served by this municipal system, 62 typical cases occurred during the weeks and week-ends of September 5, 12, 19, and October 17. It was later learned that similar fall and spring outbreaks had occurred in this institution during preceding years with annoying consistency.

All cases were uniformly distributed by age, sex, color and occupation. Careful inquiry failed to incriminate a possible source of infection such as foods, milk, ice, community gatherings, visits out of town, sanitation, etc. The only vehicle common to the majority of cases was city water—actually 89.2 per cent of the cases were found to have used the city water supply almost exclusively, with an additional 8 per cent having used city water most of the time. The uniform distribution of

cases throughout the city, the explosiveness of the major outbreaks, the relative mildness of the attacks, and the uniform distribution by age, sex, and color, together with the known condition of the water supply were sufficient to justify a comprehensive study of the entire water supply system.

B. Engineering

A large spring with a dry weather flow of about 450 gal. per minute and coming from a limestone region containing numerous caverns and sink-holes provided an adequate raw water supply for the town. The concrete storage basin of 50,000 gal. capacity at the spring was inadequately protected against surface contamination. An elevated tank and standpipe holding 75,000 and 325,000 gal., respectively, floated on the system to provide storage and equalize pressure. Chlorine was applied to the pump suction and the water pumped immediately to the distribution system without further treatment.

The State Health Department engineers have since 1931 recognized certain potential dangers of contamination from 4 known cross-connections. Repeated but unsuccessful recommendations have been made for their elimination. The operation records of the system submitted to the State Health Department have been excellent. These records together with routine engineering investigations indicated that the supply was reasonably safe. Daily tests indicated a chlorine residual of 0.2 to 0.4 p.p.m. throughout the preceding 2 years. Daily turbidity tests covering 6 weeks early in 1936 showed excessive turbidity following rains. These readings varied from 5 or less to as high as 340 following a heavy rain on the watershed, but apparently bore no significant relationship to the epidemics. Further studies revealed an actual chlorine residual of only 0.1 p.p.m. in-

stead of the 0.2-0.4 p.p.m. previously reported. The operator's error in reporting chlorine residuals was due to defective color standards and a previously unsuspected chlorine demand of the untreated water. The water level in the tanks was found to be gradually decreased during the week and built up over week-ends, causing the pump pressure to vary from 75 lb. on Mondays to 70 lb. on Fridays. The pump discharged at a rate of 260 gal. per min. at 75 lb. and 310 gal. per min. at 70 lb. pressure. The chlorinator setting was never changed to compensate for this fluctuation, and a chlorine residual of 0.1 p.p.m. on Mondays would have been even less on Fridays, perhaps below the safety margin for adequate disinfection. The chlorine dosage was increased on September 15 to maintain a residual of 0.25 p.p.m. Despite this, epidemic cases continued to occur as late as October 25. More complete investigations indicated that cross-connections probably were not contributing to the local problem.

C. Laboratory

Monthly bacteriological examinations had at no time in the past 2 years given any indication of contamination. At the time the study was begun, 6 stations, 5 on the distribution system and 1 at the untreated source, were selected for the collection of daily samples. Samples for bacteriological and chlorine residual determinations were taken from September 14 through December 14. During this period only 2 samples of the treated water, one on September 24 and one on November 13, showed contamination, and of these only 1 of the 5 10 c.c. portions showed the presence of organisms of the coli-aerogenes group. Two samples, both collected on September 14, showed a chlorine residual of 0.0. The average for all stations during the period was about 0.2 p.p.m. None of the treated samples

taken for bacteriological analysis was dechlorinated before shipment and approximately 18 hours elapsed between collection and arrival at the state laboratory. The untreated samples showed a widely fluctuating coli-aerogenes contamination, varying from an occasional zero to more than 24,000 organisms per 100 c.c. on numerous occasions. The highest recorded finding was 240,000. There was no evidence to indicate that the outbreaks were of chemical origin.

D. Miscellaneous

A terra-cotta sewer outfall serving about 75 homes, with an estimated average discharge of 6 gal. per min., passed within 60 ft. of the spring (Chart II). On November 10, it was noted that there was no discharge of sewage at the sewer outlet. A check of manholes revealed a steady flow at No. 5 but only an intermittent flow at No. 4. Excavation of the sewer outfall between these two points was started immediately, and on November 14 a leak was found about 40 ft. higher than the spring and 200 ft. away. Sewage was flowing through an improperly sealed joint and into a cavern which appeared to lead toward the spring. This leak was stopped immediately. The terra-cotta outfall was later replaced with cast-iron pipe. A storm drain was also found to be emptying into the sewer and apparently was the principal cause of the turbidity previously referred to.

The improvement in bacterial quality of the untreated spring water following this correction is shown in Table I. The reduction in turbidity has been equally noticeable since the sewer was repaired, with only 6 readings exceeding 10 and none exceeding 25.

A connection between the point at which the sewer leaked and the spring was proved by the use of a salt solution. One hundred lb. of salt were dis-

TABLE I

Estimated Number of Coli-Aerogenes Organisms per 100 c.c. in Water of a Tennessee Town—1936-1937

Before Leak in Sewer Repaired		After Leak in Sewer Repaired	
Date	Estimated No. Organisms	Date	Estimated No. Organisms
11/ 4/36	0	11/15/36	0.0
11/ 5/36	2,300	11/16/36	230.0
11/ 6/36	2,300	11/17/36	2.2
11/ 7/36	0	11/18/36	2.2
11/ 8/36	0	11/19/36	8.8
11/ 9/36	2,300	11/20/36	0.0
11/10/36	940	11/21/36	5.0
11/11/36	0	11/22/36	0.0
11/12/36	240,000+	11/23/36	5.0
11/13/36	0	11/24/36-	
11/14/36 *	900	12/14/36 Daily	0.0

* Leak in sewer repaired

solved in 50 gal. of water and drained into the cavern together with a stream of water at the rate of 6 gal. per min. for 8 hours. The solution was detected in the spring water 10 hours after the experiment was started and persisted for 20 hours or longer. The solution could not be detected at the end of 40 hours. Table II shows the results of these tests.

CHART II

DIAGRAMMATIC SKETCH OF CITY SPRING AND ENVIRONS

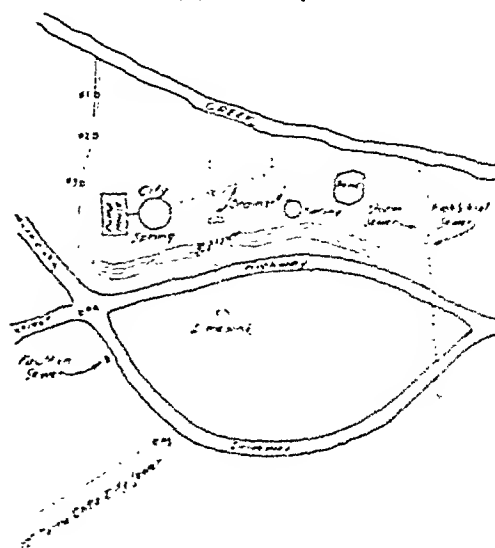


TABLE II

*Records of Chloride Determinations in
Water of a Tennessee Town—1936*

<i>Date</i>	<i>Time</i>	<i>Chlorides Parts per Million</i>
11/24/36	7:15 A.M.	0.0
	9:00 A.M.	NaCl applied to leak in sewer
	12:00 Noon	0.0
	6:00 P.M.	0.0
	7:00 P.M.	1.0
11/25/36	9:00 P.M.	2.0
	1:00 A.M.	3.0
	9:40 A.M.	6.0
	10:55 A.M.	7.0
	2:00 P.M.	6.5
11/26/36	11:30 A.M.	0.0
11/27/36 to		
12/ 9 '36	Daily	0.0

ACCOMPLISHMENTS

A large portion of the terra-cotta sewer outfall has been replaced with cast-iron. The quality of the raw water showed a marked improvement after the sewer defect was corrected. The most dangerous cross-connections, although not implicated in the outbreaks, have been eliminated. Subsequent investigations have revealed that outbreaks of gastrointestinal disorders among those using city water have been conspicuously absent since the sewer line was repaired. It is particularly noteworthy that for the first time in several years spring and fall outbreaks of the disorder have not been experienced in the private school mentioned.

SUMMARY AND CONCLUSIONS

The etiology of the outbreaks is unknown but available evidence indicates that it was most likely transmitted

through the public water supply. Knowledge of possible conditions contributing to the contamination of this particular supply would lead one to suspect that one or more factors may have contributed to the outbreaks. Among them are:

1. Bacteria of the colon-typhoid-dysentery groups in the supply as a result of excessive raw water contamination and an inadequate purification process.

2. Bacteria not found by ordinary methods of water analysis. Samples were not dechlorinated at the time of collection, hence may have become sterilized during the period of transportation.

3. Bacteria not suspected, due perhaps to destruction of indicator organisms before reaching the laboratory.

4. Toxic products created as a result of septic action in the sewage that reached the raw water supply. Based on the probable concentration of such products in the supply, this possibility is considered rather remote. However, the fact that all cases recovered rapidly and without sequelae together with the absence of typhoid and paratyphoid cases in the population group over a period of years gives some support to this theory.

The study suggests: (1) The need of more exhaustive studies in this particular field, particularly as to determination of the causative organism. (2) That the epidemiologist, engineer, bacteriologist and public health administrator have specific responsibilities in coördinated studies. (3) That field laboratory equipment should be made available for studies of this type in event satisfactory laboratory facilities are not readily accessible. (4) That the more common factors contributing to these outbreaks should be eliminated before we seek the indefinite if not hypothetical cause.

Gastrointestinal Disorder Not Proved To Be Water-Borne*

D. G. GILL, M.B., D.P.H., F.A.P.H.A., AND
JAMES G. McALPINE, PH.D.

*Director, Bureau of Preventable Diseases; and Director, Bureau of
Laboratories, State Department of Health, Montgomery, Ala.*

REPORTS of epidemics of intestinal disturbances are quite common. In many instances the causative organism is readily found and the vehicle of transmission is apparent. Other more puzzling outbreaks occur in which presumptive evidence alone is obtained.

It is desired to report an epidemic of the latter type, which is of interest largely on account of the extensive studies that were made and the procedures followed.

Situated on the Chattahoochie River, which separates Alabama and Georgia, are the twin towns of West Point, Ga., and Lanett, Ala., and extending in almost continuous form from Lanett, Ala., are the various mill villages of the West Point Manufacturing Company—namely, Shawmut, Fairfax, Langdale, and Riverview. Reports as to the occurrence of cases of persistent diarrhea in this population of some 25,000 people were made during the latter part of 1935 to both the Georgia and Alabama Health Departments. The first supposition was that the disease was amebic dysentery and many of the cases were reported as such. Early

in 1936 the Health Officer of Chambers County, Ala., reported the disease to be on the increase and this led to an investigation.

LABORATORY PROCEDURES

As a preliminary step it was decided that fresh specimens should be examined from a number of these patients to confirm the tentative diagnosis of amebic dysentery. Owing to the distance from any established laboratory in the state system, a field laboratory was set up and a clinic held on February 12 and 13, 1936. Sufficient equipment was taken to make warm stool examinations and cultural studies for bacillary dysentery, and any pathogenic fungi which might be present. Differential blood counts were run and occult blood determinations were made on all specimens. Careful case histories were obtained from all patients.

Warm stools were examined microscopically for intestinal parasites. Fresh feces were plated on Endo's medium for bacillary dysentery and portions were inoculated into lithium chloride glycerine and streaked on 5 successive days on Endo plates for organisms of the typhoid-paratyphoid group. Liver infusion agar with rice starch and serum was employed for the determination of amebic cysts. Plates

* Read at a Joint Session of the Public Health Engineering and Epidemiology Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

of Sabouraud's maltose agar were streaked for the presence of pathogenic fungi.

During the 2 days, 25 patients and 14 milk handlers were examined. It was soon apparent that *Endameba histolytica* was not present. Cultural results for bacillary dysentery, organisms of the typhoid-paratyphoid group, and fungi were negative. The only finding of note was the presence of an unidentified flagellate in 5 of the 25 patients and in 1 of the 14 dairymen. The differential counts were normal but occult blood was present in a large number of fecal specimens.

Since the flagellate was the only lead it was decided to repeat the clinic and concentrate all efforts on the isolation and identification of this organism. Accordingly, on February 25 and 26, 28 patients, some of whom were the same as in the first clinic, were examined. Direct smears were studied and cultures made on Loeffler's serum saline. Also, smears were stained from iron hematoxylin.

The cultures were brought back to Montgomery where they received intensive study. The organism was definitely identified as *Trichomonas hominis*. Forty-two patients were examined during the 2 visits to Lanett. Of these, 11 showed the presence of *Trichomonas hominis*. Thirteen patients were examined at both sessions, 1 showed the presence of this organism both times, and 1 negative the first time was positive during the second examination. Although our sample of 2 cases is quite small, this does show that there is some intermittency in the discharge of this organism.

On March 6, the Georgia State Department of Health conducted a clinic in West Point. The stools of 13 patients were examined and blood counts made on each. Eosin-methylene-blue plates were streaked on successive days for the presence of members

of the typhoid-paratyphoid-dysentery group; blood agar slants were inoculated for streptococci; Sabouraud's medium was used for the detection of pathogenic fungi, and differential counts were performed. Their findings were as equally indefinite as ours in the first 2 clinics.

Because the pathogenicity of *Trichomonas hominis* is disputed, and this was the only organism found which might be a causative factor, it was decided in a conference with representatives from both the Alabama and Georgia State Departments of Health that consultant assistance was essential. Accordingly, Dr. Justin Andrews, of the Johns Hopkins University, and Dr. A. V. Hardy, of the U. S. Public Health Service, were invited to assist in the next investigation. A clinic was arranged in Lanett March 24 to 26, at which time 95 patients from Alabama and 32 from Georgia were examined. Thirty-five of these were reexamined to confirm their original findings. Fourteen normal individuals were submitted as controls.

The same general methods were employed, with the Alabama technicians doing the direct examinations, and the Georgia technicians being responsible for the bacteriological procedures. Dr. Andrews personally checked all specimens for protozoal content.

The specimens were collected in cardboard ice cream boxes without any preservative, some at the improvised laboratory and others by the nurses in the homes. Because of the promptness with which the cultures were made it was not considered necessary to use a preservative. Most of the specimens were still warm when cultured. All specimens were first subjected to examinations for protozoa and then cultured, the cultures being made on Endo and eosin-methylene-blue plates. At least one plate of each medium was used. Colonies were picked after 24

and 48 hours' incubation. The specimens were not replated, because primary interest was in demonstrating members of the *B. dysentery* group and it was decided that it would not be worth while to keep the specimens after the original plating.

Of the 127 patients examined, only 5 showed the presence of *Trichomonas hominis* and of the 32 who were re-examined, only in 3 was this organism demonstrated. In the normal control group *Trichomonas hominis* was not present. The intensive bacteriological study did not reveal any members of the typhoid-paratyphoid-dysentery group.

The findings from all 4 clinics were inconclusive. Amebic and bacillary dysentery were ruled out. No members of the typhoid or paratyphoid groups and no fungi were demonstrated. *Trichomonas hominis* was found at one of the early clinics, but final results did not incriminate this organism.

EPIDEMIOLOGICAL STUDIES

The symptomatology was that of diarrhea of acute onset, varying from 5 to 25 stools per day unaccompanied by any pain or tenesmus. There was no dehydration or emaciation, although weakness was usual. The feces showed no visible blood, but evident mucus. The severity of the disease varied, but once acquired it persisted over months.

The cases occurred on both sides of the river and in all the mill villages, although the largest number were present in Lanett which merges with West Point, Ga. Several hundred cases probably occurred, but 95 cases were carefully studied on the Alabama side, with an additional 32 from West Point, Ga. The date of onset varied from January, 1935, to the time of investigation in February and March, 1936; but the majority had their beginning after December 1, 1935. Some of the cases seen were, therefore, of

more than a year's duration, while others were of only a few days.

The disease was confined to the white population, but otherwise showed no predilection for any age, sex, or occupation. No evidence could be elicited that contact, travel, banquets, shellfish, common food supplies, patent medicines, fruits or vegetables, played a part. The milk supply for the area came from a number of dairies. The percentage distribution of cases was approximately in proportion to the size of the dairy and no evidence could be found to incriminate milk.

WATER SUPPLIES

The widespread distribution of cases naturally suggested water as the common source.

Lanett and Shawmut are supplied by the same distributing system, taking raw water from the Chattahoochie River and processing it by chemical coagulation, settling, filtration, and chlorination. Fairfax and Riverview have a separate system, but use the same methods. In addition, there is an industrial water supply to the bleachery at Lanett which is not chlorinated, but which has no connection with the regular system.

West Point obtains its supply from a creek on the west side of the Chattahoochie River and north of the city. The water is treated similarly to the Lanett supply and then collected in a brick reservoir which is flooded when the river stage reaches 23 feet, but this was not reached at any time during 1935 or 1936. There are connections between the West Point and Lanett systems so that water can be exchanged if necessary. In practice the exchange has been from Lanett to West Point and on several occasions during the time of the epidemic Lanett water was used in West Point.

Bacteriologic examination of all water supplies was carried out regularly and

at no time was there any evidence of an unsatisfactory finished product.

Follow-up of the Alabama cases revealed that the condition gradually improved and that no new cases occurred during the winter of 1936-1937.

SUMMARY

An epidemic of gastrointestinal dis-

order occurring in several adjoining towns is reported.

The procedures followed in attempting to establish the etiological agent are described.

The failure to incriminate any organism made epidemiological studies difficult, and no source could be found.

DISCUSSION

C. D. BOWDOIN, M.D.

Chief, Division of Epidemiology, State Department of Public Health, Atlanta, Ga.

I APPRECIATE very much the opportunity of discussing this paper, particularly, since we on the Georgia side had the privilege of collaborating with the Alabama group in this study.

Dr. Gill has forcibly brought out the following facts:

1. The absence of any bacterial agents that could account for the outbreak.
2. The absence of any protozoal organism that could be responsible for the outbreak. At this point I should like to state that an *E. histolytica* carrier was found among the controls.
3. Only white people were affected.
4. Age, sex, and occupation apparently were not factors.
5. The cases obtained their milk from a number of dairies and the percentage distribution was approximately in proportion to the size of the dairy.
6. There was no evidence that contact, travel, banquets, shellfish, common food supplies, patent medicine, fruits or vegetables played any part.

I feel that the above facts, by a process of elimination, point to the water supply. It is a matter of common knowledge that at the time there existed a "bottle neck," so to speak, in the river less than a mile below West Point. It is also a matter of record that when the river stage at West Point reached 20 ft., the stage below the "bottle neck" was only 12 ft. As pointed out, the West Point water supply was obtained from a creek just

before it emptied into the river. However, the river had to rise less than 2 ft. above the normal stage of 3.5 ft. before river water was being used for the West Point supply. The West Point intake was $\frac{1}{4}$ mile above the business district. In the business district of West Point 3 trunk sewer lines emptied into the river. The water intake of Lanett was situated at several hundred yards below West Point.

In connection with the West Point Manufacturing Company, situated at Lanett, there was a dye and bleachery works, the effluent from which was discharged at intervals into the trunk sewer line of Lanett at a point not distant from its outlet. The Lanett sewer outlet was situated several hundred yards below the Lanett water intake.

The idea which I am suggesting is that this condition may have come about as the result of a chemical discharged intermittently into the river and at times taken into the water supply of both Lanett and West Point due to the pooling action which the river must have had as a result of its narrowing at a point below the sewer outlet of Lanett. The points in support of this hypothesis are:

1. No known etiological agent could be incriminated.

2. The lack of secondary familial cases.
3. The chronicity of the disease and the absence of fever.
4. The outbreak resembled a water-borne one, except that it was not explosive.
5. The respective numbers of cases in the two towns were in proportion to the respective distances of their water intakes from the Lanett sewer outlet.
6. No cases were found among negroes, who for the most part obtained their water from wells.
7. All ages and both sexes were apparently equally affected.
8. Since the elimination of the "bottle neck" in the river no new cases have developed.

College Survey of Health

THE preliminary report of a survey of health of college students was presented to the American Youth Commission of the American Council on Education at its meeting May 10, at the Chamber of Commerce of the United States. The survey, conducted by Harold Diehl, M.D., dean of medical sciences, University of Minnesota, and Charles E. Shepard, M.D., director, Men Students' Health Service, Stanford University, covered 551 colleges and universities throughout the country.

Two general classes of health problems affect college students, the report states: those from deficient care and education in earlier years, and those associated with the college environment itself. To discover earlier deficiencies, each student, upon entering, should be given a thorough medical examination, to be followed by periodic examinations during succeeding years.

The value of a complete health examination at the time of entering col-

lege is shown by the fact that in 56 institutions where tests for tuberculosis are given as a matter of routine to all new students, approximately one-third (34.5 per cent) were shown to be infected, though only to a slight degree, with the disease.

The complete college health program, the study points out, should consist of 4 basic factors: a student health service for individuals, a campus public health service for the student body, classroom instruction in health matters, and physical education as a health activity and for correction of deficiencies. The success of any college health program depends upon the integrated development of these four principles, even though the extent may vary according to size, purpose, and resources of the individual college, it points out. In general, financing should be by means of term or annual assessments paid by the students, supplemented when necessary by funds of the institution.

Pathological and Immunological Studies in Poliomyelitis

And Their Significance in Therapy and Treatment*

MAURICE BRODIE, M.D., F.A.P.H.A.

Pathology Laboratory, Providence Hospital, Detroit, Mich.

A CONSIDERABLE amount of work has been carried on in the past few years in poliomyelitis toward the elucidation of the portal of entry and route of transmission of the virus and upon the significance of the so-called antibody or neutralizing substance. These studies have not only increased our understanding of the disease, but open to doubt previous concepts of treatment and prevention and open up new avenues for studying these.

In order to clarify and evaluate the experimental data herewith described, a few remarks about experimental poliomyelitis are needed to indicate the methods used. The disease agent, a filterable virus, cannot grow upon non-living media as do bacteria. It has a narrow range of host susceptibility, the central nervous system of man and certain monkeys, where it multiplies and produces lesions. The experimental animal of choice is the *Macacus rhesus* monkey. The spread or multiplication of the virus can be demonstrated by inoculation into the monkey, whereupon the animal develops fever, cerebrospinal

fluid pleocytosis, and flaccid paralysis. The histo-pathological picture of the cord and brain stem shows neuronoplasmia, with perivascular and interstitial infiltration. The spinal cord of such an animal can, upon suitable inoculation, produce the disease in another animal.

The neutralizing substances or so-called antibody is present in the blood serum of certain normal individuals, especially adults, and also in the serum of some convalescent humans and monkeys. A serum which contains neutralizing substance renders virus non-infective, so that the incubated mixture fails to infect monkeys.

The virus used in this and many other laboratories has been passed through monkeys for many years and is highly virulent for these animals. From time to time new strains obtained from spinal cords or nasal secretions are transferred to monkeys. It is essential to know whether such strains are related to or differ immunologically from the standard virus. This is done by testing with the new strains sera known to have neutralizing bodies for the passage virus and animals that have recovered from it. Likewise, animals recovered from the new virus and their sera are tested against the passage strain.

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

THE PATHOGENESIS OF THE DISEASE IN
THE MACACUS RHESUS MONKEY

The essential lesions of experimental poliomyelitis occur in the cord and brain stem and closely resemble the human findings. There has been considerable controversy regarding the route of transmission and the pathogenesis has only been established in the past few years.

Despite the systemic symptoms which may occur prior to central nervous system symptoms, one can readily rule out a primary hematogenous or lymphogenous spread. The virus has rarely been isolated from the blood or tissues other than the central nervous system.¹ In our laboratory we tested the blood of intranasally infected monkeys in the incubation period in the pre-paralytic, and late stages of the disease, and were unable to demonstrate virus.² Likewise, animals sacrificed in the pre-paralytic stage failed to show the presence of virus in the liver, spleen, lymph glands, kidneys, salivary glands or muscles.² Likewise, in keeping with the findings of others, we failed to show significant lesions outside the central nervous system in more than 50 monkeys killed in the acute stage of the disease.

The transmission of the virus through the central nervous system is not by way of the spinal fluid for it is rarely found there. We were unable to demonstrate the presence of the virus in spinal fluid removed in the incubation period, in the pre-paralytic or paralytic stages of intranasally infected monkeys.² The work of several investigators has indicated that the cellular exudate in the cerebrospinal fluid is the result of an overflow from the nervous tissue by way of the perivascular spaces. In keeping with this is the fact that symptoms may occur in the animal prior to pleocytosis or may even be absent, throughout the course of the disease.³

The idea of transmission by nerve

tracts, first suggested by Liener and Wiesner and Römer, has received considerable support by Hurst and co-workers in England and Faber and ourselves in this country. Fairbrother and Hurst⁴ traced the virus from such sites of inoculation as the brain and sciatic nerve by following the sequence of the histo-pathological changes and distribution of the virus at various stages of the disease, and concluded that it travelled by way of the nerve tracts. After intranasal instillation of virus, lesions and virus are first found in the olfactory bulbs,⁵ and follow in a general way the olfactory apparatus.^{4, 6} We^{7a} as well as Schultze and Gebhardt^{7b} have been able to prevent infection via the nasal route by sectioning the olfactory nerves. Likewise, we were unable to infect a monkey by inoculating below the line of cleavage of a sciatic nerve whose perineural sheath had been sutured. In keeping with these findings Jungleblut and Spring⁸ reported that after intracerebral inoculation into an animal with severed spinal cord, the virus failed to reach the lower segment. We have found that in animals with cut spinal cords and in which a free flow of cerebrospinal fluid was demonstrated, the virus failed to pass the gap when inoculated into either the upper or lower segment. Similar findings were obtained with both passage virus and two recently isolated strains. These experiments also help to rule out either hematogenous or lymphogenous spread of the virus for the blood supply was intact to both upper and lower segments of the cerebrospinal axis.

If the virus travels along nerve tracts one would expect its primary effects upon the neurones. This is borne out by the histo-pathological studies and by the fact that the amount of nerve cell destruction in the various areas of the cerebrospinal axis correlates with the quantity of virus present. It appears,

therefore, that in experimental poliomyelitis injury and death of nerve cells is the outstanding lesion, and that the exudate is merely secondary.

One cannot always interpret the human disease in the light of the results obtained in experimental animals. In yellow fever, for example, the virus produces a generalized disease in humans and in monkeys, while in the mouse the disease is decidedly neurotropic. The manifestations of some other viruses also vary with the host.

The portal of entry in the human has been and still is the subject of considerable controversy. In the experimental animal the virus has a definite predisposition for the olfactory nerve, but we shall consider only those studies, which deal directly with the human.

Evidence to favor the nasopharynx as the portal of entry has been: (1) The epidemiology of the disease resembles in many respects a droplet disease. (2) The onset of the disease is often accompanied by upper respiratory symptoms. (3) The virus has been isolated from the mucosa and nasopharyngeal washings of acute cases, from the nasal excretions of normal and convalescent carriers, abortive and non-paralyzed cases. (4) Rarely has the virus been isolated from the gastrointestinal contents or its mucosa.

The gastrointestinal tract as a portal of entry has received considerable attention recently by Kling and co-workers in Europe and Toomey in this country. They have pointed out certain epidemiological aspects of the disease whereby it resembles a gastrointestinal infection and have also stressed the gastrointestinal symptoms that often accompany the onset. Important are the findings of Harmon⁹ who failed to find the virus in the nasopharyngeal washings of 20 cases but who found it in the gastrointestinal contents of 5 of these cases. Equally

significant was the failure to find lesions in the olfactory bulbs of 9 acute cases, a finding in keeping with that of Smith,¹⁰ who found lesions in only 25 per cent of 56 cases.

These conflicting data in the epidemiology and in the isolation of virus from the human body, should make one consider both portals of entry, especially as some epidemics start with nasal and others with gastrointestinal symptoms.

Direct evidence upon the route of transmission, based upon studies in the human is rather meager. The idea of a general dissemination either lymphogenous or hematogenous has received considerable support, especially from clinicians, based on the systemic manifestations of the disease frequently present prior to central nervous system symptoms. Medin stressed the pre-paralytic symptoms and described the so-called dromedary or diphasic type of the disease. Many pathologists have stressed the histo-pathological lesions found outside of the central nervous system. Rissler was one of the first and recently Smith¹⁰ has stressed their importance.

On the other hand, there are those who believe that the generalized symptoms can be explained entirely upon a central origin. The virus in travelling through the central nervous system can strike the temperature and vasomotor centers in the hypothalamus giving fever, gastrointestinal or upper respiratory symptoms, and other symptoms evident in early poliomyelitis. If in monkeys where the disease is entirely neurotropic one can have a systemic phase of the disease and even diphasic attacks,³ the same should be possible in the human.

Likewise, some believe that the lesions outside of the central nervous system are inconsequential, like those of any acute infectious disease. They may not indicate a proliferation of the virus

in these organs. Our own studies of 7 cases were in accord with this belief for we found but slight changes in the spleen, lymph glands, and thymus.

Attempts to obtain the virus from the blood stream have been negative. Likewise, the virus has been isolated from organs other than the central nervous system but once,¹ although the number of attempts have been relatively few. In our laboratory different tissues, including the liver, spleen, kidney, lungs, submaxillary glands, mesenteric lymph nodes and muscle from 3 cases were tested for the presence of virus. Large quantities of these tissues failed to produce poliomyelitis in monkeys, although infections were obtained with relatively small amounts of cord tissue from these cases.

It is hardly likely that the virus is carried by the cerebrospinal fluid, for our attempts and those of others have failed to reveal the presence of virus in it. Moreover, the pleocytosis may occur after the onset of nervous symptoms, or be absent, suggesting that the cells enter the sub-arachnoid space from

the cord. The increase in protein sometimes occurs after the pleocytosis, hardly likely if the meninges were involved earlier than the cord. Therefore, axonal transmission and primary involvement of the neurones, the latter suggested by Charcot and Jeffrey 65 years ago, must be considered, but is in need of further proof.

The presence of neutralizing bodies and resistance to the disease are not necessarily correlated:

IMMUNOLOGICAL STUDIES

When the virus of poliomyelitis is inoculated into a susceptible host, 2 changes can occur: one a resistance to reinoculation, the other the development of the so-called neutralizing substances. It was thought until recently that these correlated.

As has been recently pointed out by Schultz and Gebhardt^{11a} and Olitsky and Cox,^{11b} we have found that animals inoculated by the skin route with active or modified virus may develop neutralizing substances and yet fail to resist intracerebral inoculation of virus.

TABLE I

Monkey No.	Clinical Course	Intracerebral Reinoculation		Neutralization Tests	
		Time After Onset	Result	Time After Onset	Result
J 207	Arms and legs weak, later legs par., resid. par.	3 weeks	Resistant	2 weeks 8 weeks	— — — *
J 64	Legs par., arms weak, resid. par. in all limbs	6 "	"	6 "	— — —
R 62	Legs par., arms weak, resid. in legs	6 "	"	6 "	— — —
J 230	Weakness in arms, ataxia, complete recovery	8 "	"	3 mos.	+
69	Right leg par., other limbs weak, residual in legs	6 mos.	"	7 "	—
V 8	Left leg par., other limbs weak, resid. in all limbs	7 "	"	8 "	+
B 79	Arms par., one leg par., residual one leg	10 "	"	7 "	—
T 6	Left arm par., legs weak, complete recovery	8 "	"	6 "	—

* — serum failed to neutralize

** + serum neutralized

Likewise, Jungleblut^{12a} and Sabin and Olitsky^{12b} have shown that recovered monkeys may resist reinfection, yet possess no serum neutralizing substances. Upon extending these studies, it was found that the serum of only 3 out of 8 convalescent monkeys, which were resistant to reinoculation, neutralized the virus although tested as long as 8 to 9 months after the onset of the disease (Table I). A number of investigators have shown that the sera of convalescent patients may fail to neutralize the virus. Recently we carried out an extensive study upon convalescent sera obtained from children admitted to the Willard Parker Hospital during the New York City outbreak in 1935.¹³ The sera of a large group of children, both paralytics and non-paralytics, were tested upon admission, that is, within a few days of the onset of the disease. A number of those individuals who failed to neutralize the virus, were retested at short intervals up to 8 or 9 months after the onset. The composite results given in Table II indicate that the majority of these children failed to develop neutralizing substances in their sera. Moreover, 14 out of 82 paralytics had neutralizing substances within the first few days of illness and 2 of these in the pre-paralytic stage. Harmon and Harkins¹⁴ also reported the presence of antibody in the serum of a patient tested

TABLE II
Summary of Neutralization Tests During First Year of Convalescence of Individuals Whose Sera Failed to Neutralize in the First Week

Age Groups Years	Paralytic		Non-paralytic	
	Number Tested	Number Neu- tralized	Number Tested	Number Neu- tralized
1- 5	16	1	2	0
6-10	14	0	6	0
11-17	6	1	3	0
Adult	3	0	0	0
Total	39	2	11	0

in the pre-paralytic stage. One might say that these 14 individuals responded to the virus with antibody formation, very quickly. On the other hand, of 39 who lacked antibody upon admission, but 2 developed it within some months after the onset. This leads me to believe that poliomyelitis can develop in the presence of neutralizing substances.

ANTIBODY IS PROBABLY AN INDICATION OF IMMUNITY

From these data one may well inquire as to whether the presence of neutralizing substances is any indication of immunity. Up to the present time there is no such evidence in the experimental animal. This may be due to the fact that the level of neutralizing substances is not sufficiently high, or because the virus is neurotropic anti-

TABLE III
Summary of Neutralization Tests with Sera Taken in the First Week of the Disease and from Normals

Age Group in Years	Paralytics			Non-paralytics			Normals		
	Number Tested	Sera Neu- tralized	Sera Failed to Neu- tralize	Number Tested	Sera Neu- tralized	Sera Failed to Neu- tralize	Number Tested	Sera Neu- tralized	Sera Failed to Neu- tralize
1- 5	26	2	24	6	1	5	96	5	91
6-10	25	4	21	14	10	4	38	11	27
11-17	19	4	15	10	5	5	25	19	6
Adults	12	4	8	2	2	0	13	7	6
Totals	82	14	68	32	18	14	172	42	130

bodies cannot reach it. In humans there is evidence to indicate that neutralizing substances correlate to some extent with immunity. The incidence of the presence of neutralizing substance is at the onset of the disease decidedly higher in non-paralytics, than in paralytics (Table III). There is even more evidence in individuals over the age of 10, of whom more than 50 per cent show neutralizing substances, very much like the so-called normals (Table III). This decidedly smaller proportion of paralytics, especially over the age of 10 who possess antibody as compared to non-paralytics, or normals, suggests that the neutralizing substances help to limit or prevent infection.

THE SPECIFICITY OF THE NEUTRALIZING SUBSTANCES

Do the above inconsistencies between the presence of neutralizing substances and resistance disprove the idea that the former is a specific response to the virus? In other words, does it respond only from exposure to the virus, or can it result from other factors as developmental changes such as Jungleblut and Engle have suggested?¹⁵ It might even result from exposure or reaction to a related antigen.

There are certain factors in the epidemiology of the disease on account of which it is difficult to explain the presence of neutralizing substances in adults on the basis of sub-clinical immunization.¹ Moreover, the antibody is present in the sera of individuals who reside where poliomyelitis is almost absent.¹

On the other hand the distribution of the neutralizing substances in the sera of both urban and rural residents follows the trend of the Schick test and in diphtheria this immunity is well founded upon exposure.¹ It is absent from the sera of monkeys where the

likelihood of exposure to the virus is remote. We have been unable to demonstrate neutralizing substance in the sera of monkeys of different ages, nor were they resistant to inoculation.

Moreover the failure to develop neutralizing substances in convalescents does not distract from the idea of the specificity of the antibody. One can scarcely assign the inability of those affected with poliomyelitis to a general constitutional defect in view of the fact that so many monkeys may fail to show its presence in convalescence. Likewise it does not seem to be an inhibition of antibody formation for neurotropic viruses. To this end the sera of 10 convalescents, some known to have poliomyelitis antibody and some that lacked its presence were tested against a neurotropic herpes virus. There was no correlation, and convalescents who failed to develop poliomyelitis neutralizing substances showed herpes antibodies.

In other virus diseases, antibody may be absent in convalescence, and so its absence in poliomyelitis convalescents should not appear unusual. Its presence or absence may depend upon the amount of virus that leaves the central nervous system to reach the antibody depots. The occasional development of antibody more than a year after the onset may be the result of hyper-immunization.²³

A very strong argument in favor of the specificity of the antibody is the fact that it has been produced experimentally, only after exposure to the virus.

THE TREATMENT OF POLIOMYELITIS

Prior to 1931 serum was generally recommended in the treatment of pre-paralytic poliomyelitis, despite the lack of statistically controlled data to prove its worth. As a result of two separate controlled studies carried out during 1931,^{1,24, 25} in which alternate cases

without paralysis were treated with serum, the mortality and paralysis rates were approximately the same for treated as untreated cases. In the experimental animal, where the disease is entirely neurotropic so that the virus contained in the central nervous system is walled off from the blood system by the Virchow-Robin spaces, extremely large doses of tested serum, of high neutralizing power, failed to affect the course of the disease.¹⁷ Serum or whole blood in 100 to 300 c.c. amounts was given intravenously at the onset of symptoms and in one instance during the incubation period.

Should human poliomyelitis prove to be a systemic disease with secondary localization in the central nervous system, can better results be obtained with larger amounts of more potent serum? This question may well be asked, since untested convalescent serum was used in the 1931 New York outbreak, and so many of the specimens making up the pools of sera probably lacked neutralizing antibodies. However, the diagnosis of poliomyelitis cannot be made until meningeal manifestations are apparent and then the central nervous system is already involved. At best the serum could only prevent more virus from entering the central nervous system. Little of it could pierce the blood-central nervous system barrier any more than can salvarsan. Any that pierced the barrier, broken down through inflammation, would be ineffective in preventing further spread of the virus, for a virus that is already fixed to cells can grow in the presence of its own antibody.

Various nonspecific treatments have been advocated and tried. Among these are repeated lumbar puncture or spinal drainage. It seems hardly likely that the increased flow of spinal fluid can wash out the virus that is already fixed to the nerve cells. Adrenalin, ephedrin, and hypertonic solutions have been

used to relieve the edema and congestion of the central nervous system, but without definite results. These measures may be of value in bulbar cases to relieve, temporarily, pressure upon the vital centers.

ACTIVE IMMUNIZATION

Because of the belief prevalent until recently that neutralizing substances were indicative of immunity to poliomyelitis, a considerable amount of the active immunity work in monkeys was gauged by the antibody response. Neutralizing substances have been produced in monkeys with skin inoculation of active virus,¹ virus-serum combinations,¹ attenuated¹ or germicidally treated, non-infected virus.^{11, 18} I have also reported that some¹⁸ animals which had received formalized virus were also resistant to intracerebral inoculation of virus. Other workers have failed to confirm this finding.¹¹ Whereas I used for the test dose what approximated a minimal infective dose of virus, these experimenters injected stronger doses. The reliability of such small doses has been questioned.¹⁹ Further investigation upon this subject leads me to believe that it is unwise to use such small doses of virus to test animals.

Both the ricinoleated virus used by Kolmer²⁰ and the formalized virus used by ourselves produced neutralizing substances in children. Children whose serum failed to neutralize in the control period, appeared to respond better than monkeys. Aycock and Hudson^{21a} and Kramer^{21b} found children in an epidemic area developed antibody within several months. The former tested sera from a group of children from an epidemic focus during the 1935 North Carolina outbreak who had received formalized vaccine and compared the findings with a group of non-vaccinated children. The tests were carried out just before vaccination and sera

were again obtained approximately 2 months after the first dose of vaccine. Of these whose sera failed to neutralize in the first test, 10 of 19 vaccinated and 9 of 31 controls had developed neutralizing bodies.

The children whom we tested were in a poliomyelitis free area, and the tests were carried out within 3 to 4 weeks after the administration of the vaccine. It seems likely, therefore, that the antibody response was due to the vaccine. Altogether, 10,000 children received formalized virus, but the number was too small to give information as to the value of the vaccine from a comparison of the incidence of the disease in the vaccinated individuals and the controls. A report by the Kern County health authorities, who vaccinated nearly 4,000 individuals in an epidemic area, concluded as follows: "Although the results are not statistically conclusive, they strongly suggest an actual immunizing effect from the Brodie vaccine."²²

The probability of obtaining an effective vaccine will depend upon several factors. In the first place should the human disease prove to be neurotropic as in the monkey, it will be difficult and perhaps impossible to develop a safe and effective vaccine. If, on the other hand, the human disease proves to be systemic, then by analogy with other diseases, a non-infective vaccine may produce immunity.

The measure of a person's reaction to the vaccine will be the presence of neutralizing substances. It will be necessary therefore to carry out further work with a view of determining the relationship of the presence of antibody to resistance to the disease. It will also be necessary to determine whether or not susceptible individuals are capable of producing neutralizing substances. The need for a susceptibility test is quite obvious.

The practical application of a vac-

cine will be in a large measure determined by whether a single or multiple strains exist. If multiple strains that are unrelated immunologically exist, it will be hardly feasible to prepare a polyvalent vaccine. Until recently the evidence has been that differences in strains were quantitative—that is, the results of differences in virulence. Recently several investigators have reported that qualitative changes exist. In our studies upon 3 strains, we found that one was almost identical with the passage strain and that the other two differed qualitatively. One must bear in mind the possibility of only one strain existing in the human, but that virus specimens can be modified in passage through the monkey. There is evidence of this in other virus diseases.

NASAL SPRAYS AS A METHOD OF PREVENTION

Tannic acid, alum, silver nitrate and other astringents²³ applied to the nasal mucosa protect monkeys against intranasal instillation of virus. Although the exact mechanism by which these substances can protect monkeys from intranasal infection is not definitely known, it is believed that they protect the olfactory nerves from the virus. The method was applied to humans in the summer of 1936 in Alabama by Armstrong of the U. S. Public Health Service,²⁴ but the results were not encouraging. Armstrong felt that the failure was due in part to improper application of the spray.

On the other hand, there are other reasons which speak against the probable success of the nasal spray as a means of prevention in children, although it protects monkeys against nasal infection. Due to frequent blowing and picking of the nose, and other forms of trauma to the mucosa of children, the applications may not last sufficiently long to serve as a successful barrier, or the irritation produced may

weaken the olfactory barrier if the virus travels along the olfactory nerve. Secondly, the spray can be administered to young children only with difficulty. Even more important is the possibility that the virus may not travel along the olfactory nerves. It would seem more logical, therefore, to elucidate the portal of entry and path of the virus and let the future use of the nasal spray be guided by the results.

CONCLUSIONS

1. The virus of poliomyelitis in the experimental animal is strictly neurotropic and travels by way of the nerve tracts.
2. Neither the portal of entry nor the pathogenesis has been finally determined in the human. Therefore one cannot draw too close an analogy between the experimental and human diseases, nor apply all experimental results that bear upon the portal of entry and pathogenesis to the human.
3. The immunological data were studied upon which the following conclusions can be stated:
 - a. The presence of serum neutralizing substances or the so-called antibodies and resistance to the disease do not necessarily correlate. However, in the human there is evidence to believe that the presence of antibody may be indicative of immunity.
 - b. Recovery from poliomyelitis does not, as a rule, result in demonstrable antibodies or neutralizing substances.
 - c. The so-called neutralizing substance can develop only as a result of specific exposure to the virus.
 - d. There is evidence to believe that more than one strain of virus exists.
4. Neither convalescent serum nor any of the other available measures of treatment that have been advocated offer any hope for the prevention or limitation of paralysis in treated cases.
5. The value of active immunity as a preventive is undetermined. Further studies should be withheld until the human pathogenesis has been worked out; also further immunology, especially upon the question of strains.
6. Nasal sprays are effective in protecting the monkey. In the human the results are not encouraging and the reasons are discussed for believing that they may not protect the human.

BIBLIOGRAPHY

1. *Poliomyelitis*, International Committee. Williams & Wilkins, 1932.
2. Brodie, M., and Elvidge, H. R. *Arch. Neurol. & Psychiat.*, 33:1362, 1935.
3. Brodie, M., and Wortis, S. B. Cytologic Studies of Cerebro-spinal Fluid and Respiratory Metabolism of Excised Spinal Cord and Brain. *Arch. Neurol. & Psychiat.*, 32:1158, 1934.
4. Hurst, E. W. A Further Contribution to the Pathogenesis of Experimental Poliomyelitis: Inoculation into the Sciatic Nerve. *J. Path. & Bact.*, 33:1133, 1930.
5. Ishbrother, R. W., and Hurst, E. W. The Pathogenesis of, and the Preparation of the Virus in, Experimental Polio. *J. Path. & Bact.*, 33:17, 1930.
- 5a. Flexner, S., and Clark, P. F. The Olfactory Bulbs in Experimental Poliomyelitis. *Proc. Soc. Exper. Biol. & Med.*, 13, 10-1, 1912.
- 5b. Sabin, A. B., and Olitsky, P. K. The Olfactory Bulbs in Experimental Poliomyelitis. *J.A.M.A.*, 105:21, 1937.
6. Faber, H. K., and Gebhardt, L. P. Localization of the Virus of Poliomyelitis in the Central Nervous System During the Pre-paralytic Period. After Intranasal Inoculation. *J. Exper. Med.*, 57:935, 1933.
- 7a. Brodie, M., and Elvidge, A. R. The Portal of Entry and the Transmission of the Virus of Poliomyelitis. *Science*, 79:235, 1934.
- 7b. Schultz, E. W., and Gebhardt, L. P. Olfactory Tract and Poliomyelitis. *Proc. Soc. Exper. Biol. & Med.*, 31:728, 1934.
8. Jungblut, C. W., and Spring, W. I. A Note on the Propagation of the Virus in Experimental Poliomyelitis. *Proc. Soc. Exper. Biol. & Med.*, 37:1076, 1930.
9. Discussion of paper by Toomey, J. *J.A.M.A.*, 109:402, 1937.
10. Landon, J. F., and Smith, L. W. *Poliomyelitis. A Handbook for Physicians and Medical Students*, based on a study of the 1931 epidemic in New York City. Macmillan Co., 1934.
11. Schultz, E. W., and Gebhardt, L. P. *Cal. & West. Med.*, 43:1, 1935.
- Olitsky, P. K., and Cox, H. R. Experiments on Active Immunization Against Experimental Poliomyelitis. *J. Exper. Med.*, 63:109, 1936.
- 12a. Jungblut, C. W. *J. Infect. Dis.*, 58:150, 1936.
- 12b. Sabin, A., and Olitsky, P. K. Humoral Antibodies and Resistance of Vaccination and Convalescent Monkeys to Poliomyelitis Virus. *J. Exper. Med.*, 64:739, 1936.
13. Brodie, M., Fischer, A. E., and Stillerman, M. Neutralization Tests in Poliomyelitis. *J. Clin. Invest.*, 16, 3:447, 1937.
14. Harmon, P. H., and Harkins, H. N. The Significance of Neutralizing Substances in Resistance and Recovery from Poliomyelitis. *J.A.M.A.*, 107:552, 1936.
15. Jungblut, C. W., and Engle, E. T. Resistance to Poliomyelitis; Relative Importance of Physiologic and Immunologic Factors. *J.A.M.A.*, 99:2071, 1932.
- 16a. Park, W. H. Anti Serum in Pre-paralytic Cases of Poliomyelitis. *J.A.M.A.*, 99:1050, 1932.
- 16b. Kramer, S. D., Aycock, W. L., Solomon, C. I., and Thenebe, C. L. Convalescent Serum in Pre-paralytic Poliomyelitis. *New Eng. J. Med.*, 206:432, 1932.
17. Brodie, M. Role of Convalescent Serum in Pre-paralytic Poliomyelitis. *J. Immunol.*, 28:353, 1935.
18. Brodie, M. Active Immunization in Monkeys with Inactivated Virus. *J. Immunol.*, 28:1, 1935.
19. Rivers, T. M. Immunity in Virus Diseases with Particular Reference to Poliomyelitis. *A.J.P.H.*, 26:136, 1936.
20. Kolmer, J. Successful Method of Vaccination Against Acute Anterior Poliomyelitis. *J.A.M.A.*, 124:456, 1935.

21a. Aycock, W. L., and Hudson, C. C. The Development of Neutralizing Substance for Poliomyelitis Virus in Vaccinated and Unvaccinated Individuals. *New Eng. J. Med.*, 214:715, 1936.

21b. Kramer, S. D. Active Immunization; Comparative Study; Attempts at Immunization of Monkeys and Children with Formalized Virus. *J. Immunol.*, 31:167, 1936.

22. Gifford, M. A., and Bogen, E. Immunity Against Infantile Paralysis. *Ann. Rep., Kern County Health Dept.*, July 1, 1935 to June 30, 1936.

23. Armstrong, C., and Harrison, W. T. Preven-

tion of Intranasally Inoculated Poliomyelitis of Monkeys by Instillation of Alum into Nostrils. *Pub. Health Rep.*, 50:725, 1935.

Sabin, A. B., Olitsky, P. K., and Cox, H. R. Protective Action of Certain Chemicals Against Infection of Monkeys with Nasally Instilled Poliomyelitis Virus. *J. Exper. Med.*, 63:877, 1936.

Schultz, E. W., and Gebhardt, L. P. Zinc Sulphate Prophylaxis in Poliomyelitis. *J.A.M.A.*, 108:2182, 1937.

24. Armstrong, C. Picric Acid Alum Spray in Poliomyelitis. *A.J.P.H.*, 27:103, 1937.

International Nursing Scholarships

THE establishment by the Central Committee of the American Red Cross of two scholarships to be awarded annually over a period of 5 years to an American nurse and to a nurse from another country to attend the courses offered by the Florence Nightingale International Foundation in London, England, was announced by Ida F. Butler, National Director of the American Red Cross Nursing Service, at the opening session of the National Nursing Biennial Convention, held in Kansas City, Mo., April 25.

The scholarships are established in memory of Clara Dutton Noyes, who served as director of the Bureau of Nursing of the American Red Cross during the World War, and as National Director of its Nursing Service from 1919 until the time of her death in 1936.

The Florence Nightingale International Foundation represents a living memorial to Florence Nightingale, the founder of modern nursing, and offers nurses everywhere an effective method of working specifically for peace through understanding. Inaugurated in 1934, by the League of Red Cross Societies and the International Council of Nurses, the Foundation provides an endowed trust for postgraduate education in public health nursing, and teaching and administration in schools of nursing at Bedford College, London, in coöperation with the British College of Nursing.

Almost 400 nurses from 47 countries of the world have taken the courses which are now under the aegis of the Florence Nightingale International Foundation. Seven of them have been American nurses.

Rural Syphilis—A Localized Outbreak

R. C. KIMBROUGH, M.D., D. M. COWGILL, M.D., F.A.P.H.A.,
AND E. P. BOWERMAN, M.D.

Monroe County Health Unit, Madisonville, Tenn.

IN Monroe County, Tenn., there occurred an episode which it is believed illustrates some of the important factors in the control of syphilis in rural areas.

Monroe County is situated in the extreme eastern part of the state. It is almost entirely rural and the population is 95 per cent native white.

In July, 1935, a boy from a CCC camp was discharged because he had syphilis. He had had sufficient treatment to render him supposedly non-infectious, namely, 5 doses of neosalvarsan and 5 doses of bismuth. He was presumably told that he would need further treatment before he would be cured.

The County Health Department was notified of the boy's discharge and treatment status. He did not report to the health department nor could he be found by the department, due to his going to another part of the county under an assumed name.

In October, 1935, he suffered a relapse, having mucous patches, condylomata and a skin rash, and reported to a physician for treatment.

Before applying for treatment he had directly infected 2 and directly or indirectly a 3rd rural prostitute.

The private physician whom the patient consulted explained to him the nature of the disease, and since that time he has been faithful in taking treatments. He also revealed the names of his contacts after his return

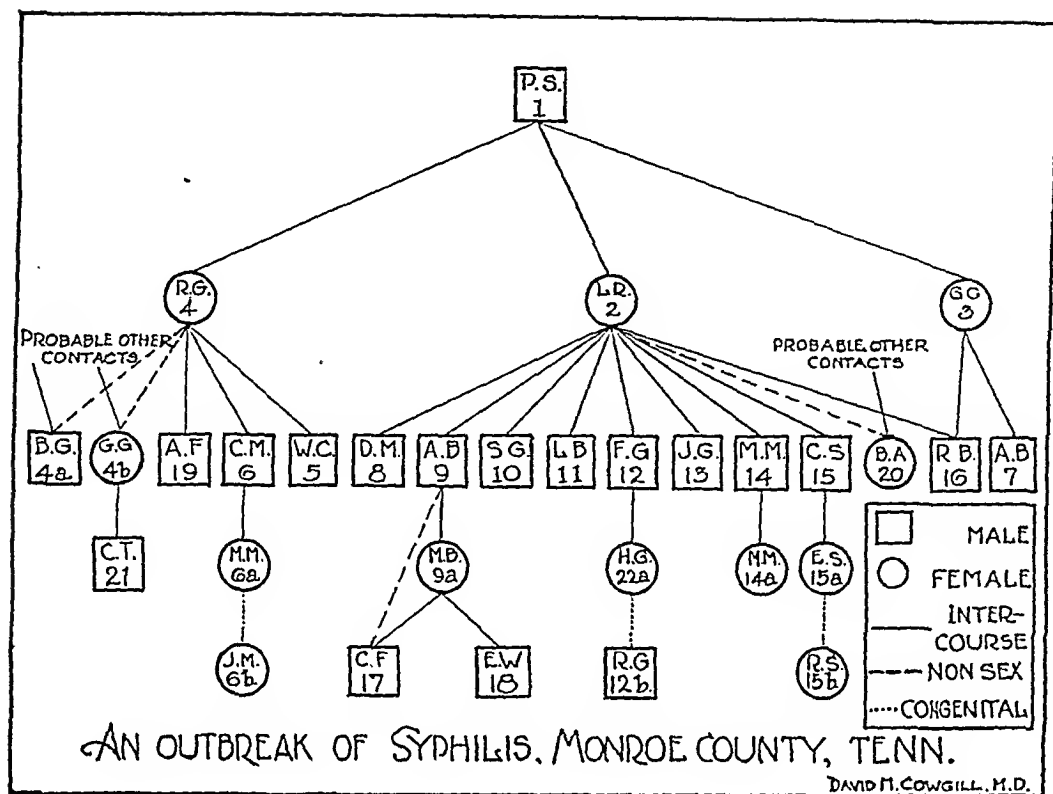
to the county to the physician who reported the case and contacts to the health department. The physician assisted in locating the contacts, and treated some of them as private patients.

The 3 girls with whom he had had contact were found and brought under treatment. All of the known contacts of these girls, some 23, were examined. Of these, 7 were negative and 16 positive. Three of the positive had other possible source of contacts. After being brought under treatment there were no further cases traced to these 3 girls until one of them discontinued treatment. She had an infectious relapse and infected 1 person. This lapse in treatment occurred in spite of repeated instruction as to the nature of the disease.

Since January, 1937, no further cases have been traced to this source. Now, February, 1938, it is possible that after the completion of the treatment of the last cases this epidemic will be closed. It is too early to be certain of this since 3 cases relapsed after having as many as 20 doses of neosalvarsan plus heavy metals, and infected other people.

Among those who have contracted the disease directly or indirectly from this source were 4 wives who were infected by their husbands. One daughter contracted the disease from her father and spread it to 2 other men.

The accompanying chart shows the



method of spread from the original case to the other persons. In some cases, contacts were 4 steps removed.

The spread of the disease may be considered as having 4 phases:

1. The initial case and his infection of 3 prostitutes
2. The spread contacts of the 3 prostitutes
3. The passage of the disease from those infected by prostitutes to others, principally family contacts
4. The ultimate bringing under control of all cases with the close of the episode and cessation of spread of the disease.

This episode is a minor one in the history of syphilis, but it illustrates dramatically the steps which must be taken to eliminate syphilis from a rural county.

CONCLUSIONS

1. The careless, ignorant, transient may cause epidemics of syphilis in his wanderings. When this type of person is found to be infected, he should be rigidly controlled by some agency.

2. The general practitioner is a very important element in the attack on syphilis. As in this case, the patient usually goes to the private physician first. Realizing the importance of the situation, the physician in this case obtained the names of the contacts and was instrumental in seeing that both the original case and the infected contacts were effectively treated.

3. Infected persons will usually give the names of contacts when questioned tactfully. These contacts, familial and extra-familial can be found if looked for and brought under treatment if infected. If they are treated with consideration they will usually continue their treatments.

4. Infectious relapses occurred even after as many as 20 doses of neosalvarsan plus heavy metal therapy. It is not believed that these were new infections.

5. When the main sources of infection in this particular episode were

found and kept under treatment, it came to a close. This came about because of the joint efforts of the private physician and the health officer.

If all cases of syphilis were studied

from the standpoint of finding the sources and the contacts located and put under adequate treatment, syphilis would become a rare disease in the rural areas in a short time.

Housing Survey

ACCORDING to the Preliminary Report of the National Health Survey on "Adequacy of Urban Housing in the United States as Measured by Degree of Crowding and Type of Sanitary Facilities":

Three million urban families in the United States have fewer rooms in their homes than there are persons; one million live in dwellings with more than one and a half times as many persons as there are rooms; 700,000 live in dwellings with at least twice as many persons as there are rooms.

These estimates for urban families are based on figures obtained in the National Health Survey, 1935-1936, for a representative group of 83 cities. The number of persons in 740,000 urban households was recorded and also the number of rooms which any group occupied. Thus it was possible to calculate the number of persons per room for each of these households. . . .

The data at least suggest that in all parts of the country families on a fairly high economic level secure adequate housing. This is especially true with respect to any judgment of adequacy based on the type of sanitary facilities. It is among the relief and other low income groups, especially in the colored population, that the greatest variation occurs. For such groups the kind of sanitary facilities available varies greatly, depending on the part of the country and the size of the city in which they live, as well as on many other factors. . . .

Data have been collected in a project conducted by the U. S. Public Health Service, with the aid of financial grants from the WPA, in a house-to-house canvass of about 800,000 families including 2,800,000 persons in 83 cities, and 23 rural areas in 19 states.

Lactobacillus Acidophilus and Dental Caries*

PHILIP JAY, D.D.S.

School of Dentistry, University of Michigan, Ann Arbor, Mich.

DENTAL caries, due to its widespread distribution and steadily increasing incidence, is worthy of the serious attention of students of public health problems. It is the purpose of this report to emphasize a few established facts in the hope that a clearer concept may be had of the etiology and control of the disease.

At the turn of the century W. D. Miller¹ advanced the hypothesis that there is present in the saliva an acidogenic substance which is responsible for the initial decalcification of enamel. He demonstrated that this substance was bacterial in origin. Inasmuch as a variety of organisms which may be responsible for the breaking down of carbohydrates is found in the mouth, it was Miller's belief that no one specific microorganism but that several acidogenic types were responsible for caries. It became more clearly understood that although Miller's theory was substantially reasonable, it was true that acidogenic bacteria can also be demonstrated in the mouths of caries-free individuals with the greatest regularity. More recently² it has been shown that although acid producing coccal forms and yeasts may inhabit the mouth with no apparent danger to the teeth, the

presence of lactobacilli is invariably associated with caries. A renewal of caries activity in susceptible patients was always presaged by a marked increase of the oral lactobacilli as determined by quantitative culture of the saliva, while a drop in the lactobacillus count always signified an arrest of caries.

These findings were not very enthusiastically received since various investigators both at home and abroad were reporting the successful control of the disease by dietary means. All claimed beneficial results, but their theories as to how these results were obtained were in conflict with each other. Vitamins A and D were claimed to be specific anti-caries factors by some, while others were equally convinced that caries was a vitamin C deficiency disease. It was reported also that caries resulted from a deficiency of phosphorus and calcium in the diet. These theoretically dissimilar experimental diets were producing more or less satisfactory results. It might be inferred, therefore, that the enamel of the tooth is an unstable structure and that it is dependent for its maintenance on a variety of food factors, the absence of one or more of which results in caries. Such an inference is false, since histologically the enamel is extremely stable. At the time of the eruption of the tooth, the enamel con-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

tains neither enamel forming cells nor a demonstrable circulatory system. In this respect the tissue is atypical and it is extremely doubtful if matured enamel can respond to metabolic influences. Furthermore there is no factual evidence that the structure of the tooth is of major importance in dental caries.

Notwithstanding these apparent inconsistencies, the disease is in a measure controllable by diet. It would appear, therefore, that the experimental diets each contained a factor in common which, unknown to the investigator, was actually responsible for the beneficial result. Studies conducted in the School of Dentistry* of the University of Michigan indicate that the carbohydrate element in the experimental diets was such a factor. This possibility was brought to our attention because of the unusually low incidence of caries in an experimental group of children on a diet deficient in vitamins and minerals but almost completely sugar-free. In other words, caries was reduced on a diet that was not even suitable for normal growth and development. When large amounts of sugar in the form of candy were included in the diet, new caries soon appeared, and we observed an increase in caries when an excess of sugar was added to diets nutritionally adequate. This is explainable by the fact that the number of oral lactobacilli is proportionate to the amount of carbohydrate in the diet. Lactobacillus counts were made to rise and drop at will by increasing and restricting the amount of sugar and starch in the diet. Sugar was restricted to a greater or lesser extent in all of the beneficial diets referred to. No particular significance was attached to sugar by any of these authors other

than the supposition that artificially sweetened foods were too often consumed at the expense of nutritional necessities. Whether or not these bacteria are actually the sole cause of the disease is of academic importance. Of more immediate significance is the fact that they bear a diagnostic relationship to caries. Through quantitative estimations we were able to demonstrate that dental caries is not related to the nutritional adequacy of the diet and that the proprietary mineral and vitamin preparations being sold for the prevention of the disease are entirely ineffective.

The method used in making the quantitative lactobacillus estimation is similar to that described by Hadley.³ In order to obtain uniform volumes of saliva, the subject is instructed to chew a small piece of paraffin making it a point to shift it from one side of the mouth to the other so as to dislodge as much of the detritus from the tooth surfaces as possible. As the saliva is accumulated in the mouth it is expectorated into a large sterile tube. Three minutes is arbitrarily selected as the time for collecting the specimen. The specimen is thoroughly shaken, after which 0.1 c.c. of it is spread evenly over a tomato agar plate with a glass spreader. Glucose acid broth is also inoculated as a qualitative check. After a 4 day incubation the number of organisms per c.c. of saliva is estimated by multiplying the number of *L. acidophilus* colonies on the plate by 10.

The tomato agar used is a modification of Kulps medium, prepared in the following manner:

Mixture A—Add 10 gm. of Difco peptone and 10 gm. of Difco peptonized milk to 400 c.c. of juice filtered (through cotton) from a good quality of canned tomatoes. Heat gently to dissolve the peptone and peptonized milk. Unnecessary heating of the tomato juice should be avoided. The reaction of the solution is adjusted to pH 5.0 with lactic acid.

* The dental caries studies of the Michigan group were supported by grants from the Children's Fund of Michigan and The Horace H. Rackham Foundation.

Mixture B—Add 25 gm. of dried agar to 600 c.c. of distilled water and autoclave to dissolve the agar. Just before removing B from the autoclave, bring A to the boiling point. Then mix A and B while both are hot and filter through a thin layer of absorbent cotton. Distribute in containers and sterilize by heating in the autoclave at 120° C. for 8 minutes. The properly prepared medium is a clear agar, of a light brown color, having a final reaction of pH 5.0.

One disadvantage of this technic is the difficulty of obtaining uniform samples of saliva. At best, cultures so taken give but an approximate indication of the actual number of organisms on the tooth surfaces. Consequently before attempting to reduce the oral lactobacilli through dietary change, preliminary counts on 3 successive days are made to determine the average count. It is important to obtain these samples at the same time of day for each individual and never immediately after a meal since the number of bacteria in the saliva always falls after eating.

In the treatment of severe dental caries the patient is first placed on a diet in which the carbohydrate is moderately restricted. This usually involves the omission of all forms of confection, cake, pie, ice cream, and other artificially sweetened desserts. A lactobacillus count is made after 2 weeks, and if there has not been a precipitous drop more severe dietary restrictions are made. Occasionally it is necessary to resort to a typical high fat diabetic diet. These cases require intelligent handling by physicians with a thorough knowledge of dietetics. Although we have reason to believe that an adequate diet is not necessary for the prevention of dental caries it is of course essential for normal growth and good health.

The carbohydrates cannot be casually stricken from the diet without regard for the caloric requirement of the patient. By trial and error a diet is finally found on which the lactobacillus counts become negative or only sporadically positive. By this method caries activity was arrested in about 80 per cent of the cases under observation. A few of the highly susceptible patients have continued to have lactobacillus overgrowths despite the most drastic dietary treatment. There are some individuals, comprising about 3 per cent of our population, who seem to be immune to dental caries. Their cultures, both saliva and stool, are consistently negative for lactobacilli even when they consume candy and other sweets in excess.

Summarizing, the studies conducted by the Michigan group indicate that:

1. Dental caries activity is not related to the nutritional adequacy of the diet.
2. The disease is not arrested by supplementing the diet with mineral and vitamin preparations.
3. A diagnostic relationship exists between the growth of oral lactobacilli and dental caries activity.
4. The number of oral lactobacilli is proportionate to the amount of carbohydrate in the diet.
5. Rampant dental caries can be effectively treated by restricting the carbohydrate in the diet.

REFERENCES

1. Miller, W. D. *Micro-organisms of the Human Mouth*. S. S. White Dental Mfg. Co., Philadelphia, 1890.
2. Rodriguez, F. E. Studies in the Specific Bacteriology of Dental Caries. *Mil. D. J.*, 5:197 (Dec.), 1922. McIntosh, James, W. W., and Lazarus-Barlow, P. An Investigation into the Etiology of Dental Caries. *Brit. J. Exper. Pathol.*, 6:269 (Oct.), 1925. Bunting, R. W., and Palmerlee, Faith. The Role of *Bacillus Acidophilus* and Dental Caries. *J.A.D.A.*, 12:381 (Apr.), 1925. Jay, P. The Problem of Dental Caries with Relation to Bacteria and Diet. *J. Pediatr.*, 8:725 (June), 1936.
3. Hadley, Faith P. A Quantitative Method for Estimating *Bacillus Acidophilus* in the Saliva. *J. D. Res.*, 13:415 (Oct.), 1933.

Survival of *E. Typhi* in Sewage Treatment Plant Processes*

CARL E. GREEN, F.A.P.H.A., AND PAUL J. BEARD, PH.D.

State Sanitary Engineer, Portland, Ore.; and Associate Professor of Sanitary Sciences, Stanford University, Calif.

THE importance of typhoid fever as an epidemic disease has apparently diminished during recent decades, but it is wise to remember that typhoid has neither been eliminated nor conquered. Barriers have been placed around it to prevent its spread, but its menace is ever with us. The survival of intestinal pathogens in water and sewage has been the subject of study for many years since the early work of Jordan, Russell, and Zeit¹ in 1904. Edwards² in 1930 reviewed the research of various French and German investigators. Heukelekian and Schulhoff⁶ in 1935 presented a comprehensive historical review of the literature which need not be repeated here. The difficulties in the way of quantitative investigations have until recently been insuperable. Wilson and Blair^{3, 4} reported success using a bismuth sulphite medium. Ruchhoff found the original Wilson-Blair medium too inhibitive for *E. typhi* in his work for the Sanitary District of Chicago; subsequently he modified the media and reported more successful isolations. Heukelekian and Schulhoff⁶ in 1935 reported the de-

velopment and use of a brilliant green nutrient agar medium.

In the investigations described in this paper, Difco bismuth sulphite medium† was used. One ml. portions of proper dilutions made up with physiological saline solution were added to the solidified pour plates and spread uniformly over the surface of the medium by means of a sterile needle, care being taken to prevent any portion from reaching the outer edge and running down between the medium and the glass plate. Plates were then dried at about 40° C. and not exceeding 45° C. in a glass-top open bottom box provided with side ventilation holes. Incubation for 36 to 48 hours was required for best plate counts. *E. typhi* colonies on this medium have a dry, jet black color, button-like appearance, and are frequently surrounded by a metallic halo. Most sewage organisms are so successfully inhibited as to cause negligible interference.

A. ISOLATION OF *E. TYPHI* FROM RAW SEWAGE

During January, February, and March, 1937, 9 samples of Palo Alto, Calif., raw sewage were examined for *E. typhi*. Of a total of 55 1 ml. por-

* Abstract of a paper read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

NOTE: Tables and charts have retained original numbers, since the complete paper may be published elsewhere later.

† Prepared by Digestive Ferments Co. The writers wish to acknowledge the courtesy of this company in supplying the media used in these studies.

TABLE I
Survival of *E. Typhi* in Raw Sewage

Stored Indoors					Stored Outdoors				
Storage Days	Temp. ° C.		<i>E. Typhi</i> per ml.	Per cent Surviving	Outdoor			<i>E. Typhi</i> per ml.	Per cent Surviving
	When Sampled	pH			Temp. ° C. When Sampled	Temp. ° C. Min.	Temp. ° C. Max.		
0	20	7.4	6,500,000		20	0	9	7.4	5,000,000
1	20	7.3	4,400,000	68	7	5	9	7.4	5,000,000
2	20	7.3	4,400,000	68	9	3	9	7.4	5,500,000
3	18	7.4	700,000	11	7	5	8	7.4	2,000,000
5	18	7.4	16,000	0.25	7	1	9	7.4	30,000
6	20	7.4	12,000	0.2	13	5	13	7.2	30,000
7	20	7.4	7,500	0.1	11	2	11	7.2	12,500
9	20	7.4	2,300	0.03	10	7	10	7.3	15,000
10	20	7.5	1,500	0.02	12	6	13	7.3	9,000
12	18	7.6	180	0.003	7	0	8	7.3	5,000
14	14	7.8	30	0.0005	6	1	9	7.3	2,600
16	19	7.8	4	0.0001	8	7	9	7.4	2,200
19	17	7.8+	1		9	8	13	7.4	250
27	18	7.8+	0	0	13	3	18	7.6	5
33									0

Average Max.-Min. temperature for period—7° C.

tions plated in this group, 9 positive isolations were made from separate 1 ml. portions. Four samples collected in May, 1937, were plated but no successful isolations were made in the 21 1 ml. portions examined.

During February and March, 3 samples of raw San Francisco sewage entering the Golden Gate Park activated sludge plant were plated about 18 hours after collection. No typhoid

bacilli were isolated from the 23 1 ml. portions examined.

B. STUDIES OF THE SURVIVAL OF *E. TYPHI* IN RAW SEWAGE

Two liter portions of raw Palo Alto sewage were placed in 2 2½ liter wide-mouth glass jars fitted with rubber stoppers in which inverted U tubes were placed for ventilation. They were then inoculated with a 24 hour agar culture

TABLE II
Raw Sewage + Sludge, Simulating a Septic Tank

Unmixed Supernatant					Mixed Scum, Supernatant and Sludge		
Storage Days	Temp. ° C.	pH	<i>E. Typhi</i> per ml.	Per cent Surviving	pH	<i>E. Typhi</i> per ml.	Per cent Surviving
0	16.5	6.8	70,000,000		6.8	70,000,000	
1	17	6.6	60,000,000	86	6.6	65,000,000	93
2	21	6.5	21,000,000	30	6.5	35,000,000	50
3	19	6.4	20,000,000	29	6.4	12,000,000	17
4	18.5	6.4	1,800,000	2.6	6.4	1,600,000	2.3
6	18	6.4			6.4	45,000	0.6
7	18	6.4	9,000	0.001	6.4	45,000	0.6
9	17	6.4	650	0.0001	6.5	6,000	0.00
11	15	6.6	300	0.00004	6.6	3,200	0.03
13	15	6.6	100	0.00001	6.6	3,700	0.05
16	19	6.7	1		6.7		
18	17.5	6.7	25		6.7	650	0.002
22	17.5	6.6	3		6.6	240	0.003
24	17.5	6.8	1		6.8	90	0.0003
27	17	6.8	0		6.8	50	0.0002

of Rawlings' strain of *E. typhi*, one having an initial *E. typhi* count of 6,500,000 per ml. and the other 5,000,000. One jar was kept at room temperature exposed to north light and the other was placed outdoors exposed to sunlight during a part of the day. The contents of each jar was thoroughly mixed before sampling.

Table I shows that 11 per cent of the typhoid organisms stored at room temperature survived for 3 days. At 7 days only 0.1 per cent remained, but positive isolations were made in 1 ml. portions through the 19th day.

Typhoid organisms in sewage stored outdoors at lower temperature survived for a longer period. Positive isolations from 1 ml. were made through the 27th day. The pH range (7.2 to 7.8) in each instance was not unfavorable.

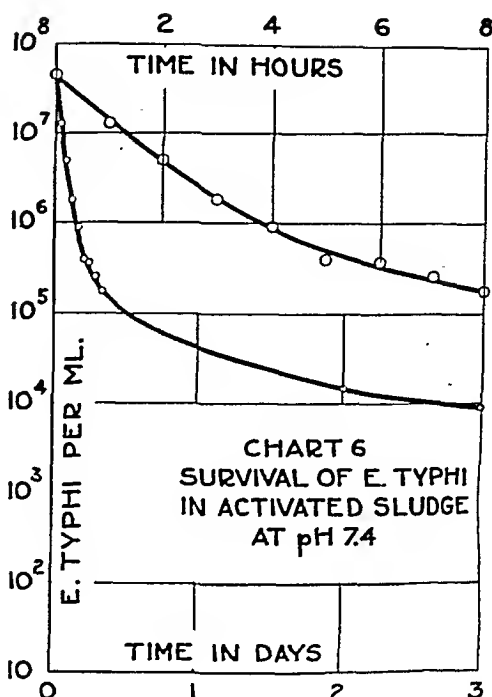
C. SURVIVAL OF *E. TYPHI* UNDER CONDITIONS SIMULATING A SEPTIC TANK

Two liters of raw Palo Alto sewage plus 400 ml. of fresh sludge were placed in each of two jars, as under B; *E. typhi* were added and the jars stored in a hood at room temperature without being exposed to sunlight. Samples were taken from the relatively clear liquor between the scum and sludge of one container and from the mixed contents of the other.

The data in Table II reveal little difference in typhi counts in the supernatant and mixed samples up to the 4th day, when only 2 per cent remained in either case. In all but 2 instances, more typhoid bacilli were found in the mixed portions. Successful isolations in 1 ml. were made in the supernatant for 24 days and in 0.1 ml. portions of the mixed sewage for 27 days.

D. SURVIVAL OF *E. TYPHI* IN ACTIVATED SLUDGE

In the following experiments, activated sludge was collected from the San Francisco Golden Gate Park plant



and aerated in the laboratory by means of glass diffusers set in wide-mouth glass jars. Activated sludge was mixed with raw Palo Alto sewage. *E. typhi* counts were made on unsettled samples.

1. Activated sludge collected one evening was allowed to stand over night and the supernatant replaced by raw sewage. After aeration for 24 hours followed by settling, the supernatant was replaced with raw sewage, *E. typhi* added to give an initial count of 37,500,000 per ml., and the experiment started. An *E. typhi* reduction of 91 per cent in 6 hours, 95 in 8 hours, and 99.9 in 24 hours of aeration was observed; the pH rose from 6.8 to 7.6 in the first 4 hours.

2. Four liters of activated sludge in a 4½ liter jar were aerated for 5 days, fresh raw sewage being used to replace the supernatant on the 2nd and 4th days. On the 5th day, *E. typhi* were added and aeration continued for 6 days; the pH remaining at 6.4. *E. typhi* counts showed a reduction of 96 per cent in 6 hours and 99 in 8 hours.

3. In an experiment similar to the one described under 2, aeration was maintained for 2 days prior to the addition of *E. typhi*; with no raw sewage added the pH dropped to 6.0. A 97 per cent reduction in *E. typhi* was indicated in 6 hours and 99 in 8 hours. As in the previous studies, a few organisms survived several days of aeration.

TABLE VI

Survival of E. Typhi in Activated Sludge at pH 7.4

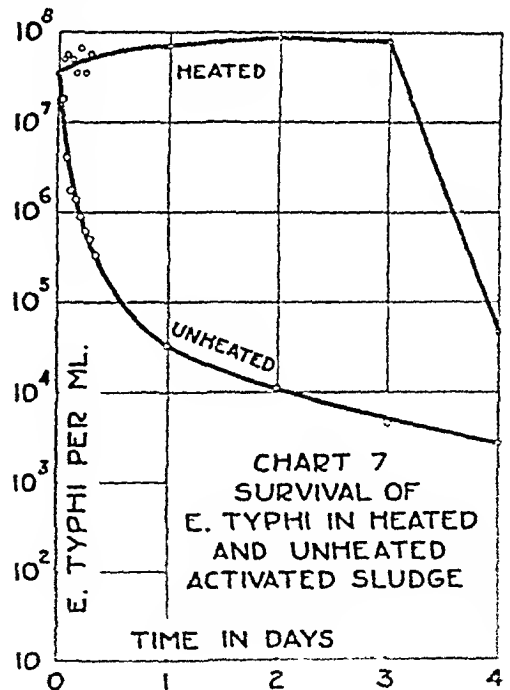
Aeration Time	Temp. ° C.	pH	<i>E. Typhi</i> per ml.	Per cent Surviving
0	17.5	7.4	45,000,000	..
1 hr.	....	...	13,000,000	29
2 hr.	....	...	5,000,000	11
3 hr.	....	...	1,800,000	4
4 hr.	18.5	7.4	900,000	2
5 hr.	....	...	400,000	0.9
6 hr.	18.5	7.4	375,000	0.8
7 hr.	....	...	260,000	0.6
8 hr.	18.5	7.4	175,000	0.4
24 hr.	17.5	7.4	....	....
2 days	15	7.4	14,500	0.03
3 days	16.5	7.4	9,000	0.02

4. In an experiment using the same batch of activated sludge as under 3, with raw sewage added once each day, the pH was constant at 7.4. In 6 hours a reduction of 99 per cent in *E. typhi* numbers was noted (see Table VI and Chart VI).

5. A study was next made of the effect of protozoa and non-spore-forming organisms on the survival of typhoid organisms in activated sludge. A sample of fresh activated sludge was thoroughly mixed with raw sewage and divided into equal 2 liter portions. One portion was then autoclaved at 80° to 95° C. for 20 minutes and water cooled to room temperature immediately thereafter. *E. typhi* were added to both and aeration started.

The results shown in Table VII and Chart VII are of interest. The pH of the heated sludge continued to rise throughout the 6 day aeration period; after the 1st day it dropped in the control jar. In the heated mixture an increase in *E. typhi* was observed for 3 days; a very abrupt reduction followed. The increase in typhoid organisms may have been caused by some hydrolysis of organic matter which furnished food, or by the lack of competitive and predatory types of organisms or both. In the control only 1 per cent survived 6 hours of aeration. After 4 days of aeration very little difference was noted in the per cent surviving in either container. This experiment seems to suggest rather definitely that biological

activity and not aeration *per se* is responsible for the reduction of typhoid organisms in the activated sludge process.



E. TRICKLING FILTER STUDIES

A search of the literature having failed to reveal any data on the survival of typhoid organisms in sewage during passage through a trickling filter, it was decided to investigate the behavior of typhoid organisms undergoing

TABLE VII

Survival of E. Typhi in Heated and Unheated Activated Sludge

Aeration Time	Unheated Sludge				Previously Heated Sludge			
	Temp. ° C.	pH	E. Typhi per ml.	Per cent Surviving	Temp. ° C.	pH	E. Typhi per ml.	Per cent Surviving
0	17	7.0	50,000,000		19.5	7.2	45,000,000	...
1 hr.	....	...	18,000,000	36	....	...	50,000,000	110
2 hr.	17.5	7.2	4,000,000	8	18	7.4	55,000,000	120
3 hr.	....	...	1,700,000	3.4	....	...	50,000,000	110
4 hr.	18	7.2	1,400,000	2.8	18	7.4	45,000,000	100
5 hr.	....	...	900,000	1.8	....	...	50,000,000	110
6 hr.	18.5	7.2	600,000	1.2	18.5	7.4	65,000,000	145
7 hr.	....	...	500,000	1.0	....	...	45,000,000	100
8 hr.	19	7.2	325,000	0.6	19	7.6	55,000,000	120
24 hr.	17.5	7.1	32,500	0.06	17.5	7.3	70,000,000	155
2 days	17.5	6.8	11,000	0.02	17.5	8.0	87,000,000	195
3 days	17	6.2	4,500	0.008	17	8.0	80,000,000	180
4 days	17	6.2	2,700	0.006	17	8.2	45,000	0.1
6 days	17.5	6.0	160	0.0003	17.5	8.4	10,000	0.02

this type of treatment. Accordingly, an experimental unit was constructed at the Palo Alto sewage plant. A filter was made up of a 6½', 24" diameter section of galvanized, corrugated iron culvert pipe set on a grid of 2 by 4's nailed on edge, spaced ½" apart, and supported by 8 by 8's. A galvanized sheet-iron tray collected the filter effluent and permitted free air movement to the underdrains. A rotary distributor having ½" diameter

arms drilled with 3/16" holes was mounted on a ¾" riser pipe. Six feet of 1¼"-2½" sound, blue, crushed rock was used. The distributor revolved 3" above the surface of the rock and was driven by a variable speed motor.

Palo Alto clarifier effluent was conveyed to a variable capacity gear pump by a 1" pipe fitted with a 14 mesh screen. A tee connection and needle valve on the suction side of the pump permitted the addition of typhoid broth

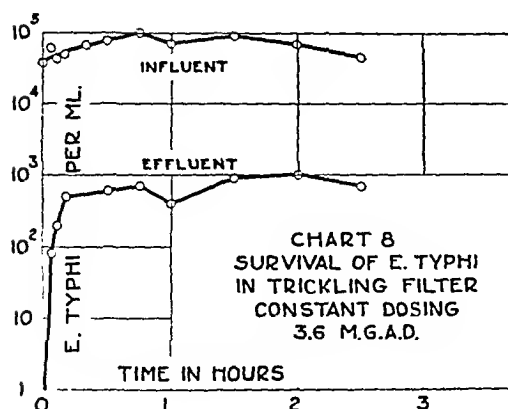
TABLE VIII

Survival of E. Typhi in Trickling Filter—Constant Dosing—3.6 m.g.a.d.

Time	Influent			Effluent		
	Temp. ° C.	pH	E. Typhi per ml.	pH	E. Typhi per ml.	Per cent Surviving
Start	22	7.3	38,000	8.0	...	...
3 min.	....	...	60,000	...	80	0.1
5 min.	....	...	42,000	...	200	0.5
10 min.	....	...	50,000	...	500	1.0
20 min.	....	...	65,000	...	...	...
30 min.	22.5	7.4	75,000	8.0	600	0.8
45 min.	....	...	100,000	...	700	0.7
1 hr.	....	...	70,000	...	400	0.6
1½ hr.	....	...	90,000	...	900	1.0
2 hr.	....	...	70,000	...	1,000	1.4
2½ hr.	23	7.3	45,000	8.0	700	1.6

Influent B.O.D. = 220 p.p.m.

Effluent B.O.D. = 55 p.p.m.



cultures. To allow for sedimentation, collection of composite samples and chlorination when desired, a 15 gal. steel tank 22" in diameter was used to receive the filter effluent.

The filter was placed in operation with constant dosing for a period of 1 month before experiments were started. B.O.D.,* D.O., N, settleable solids,

of about 300 p.p.m. and a pH of 7.2-7.4. The filter effluent contained from 5 to 8 p.p.m. D.O. and had a pH of 7.8-8.0. Solids which were not unlike activated sludge in appearance continually sloughed from the trickling filter. Filter flies bred constantly during the test runs.

1. Constant Dosing at Rate of 3.6 m.g.a.d.†

A broth culture of *E. typhi* was added to the sewage for 3 hours and counts made at intervals shown in Table VIII. The data secured and the curves plotted on Chart VIII indicate a reduction of about 99 per cent with influent and effluent curves being practically parallel. During the experiment a B.O.D. of 220 p.p.m. was reduced 75 per cent as measured by a settled effluent composite sample. In the tests which follow, B.O.D. reductions were determined by the same method, but in all instances *E. typhi* counts were made of the unsettled filter effluent.

2. Constant Dosing at Rate of 5.4 m.g.a.d.

As under 1, typhoid organisms were ap-

TABLE X

Survival of E. Typhi in Trickling Filter—Constant Dosing—6.6 m.g.a.d.

Time	Influent			Effluent		
	Temp. ° C.	pH	<i>E. Typhi</i> per ml.	pH	<i>E. Typhi</i> per ml.	Per cent Surviving
Start	23.5	7.2	5,000	7.9	..	...
5 min.	1,200	...	30	2.5
10 min.	50	...
15 min.	60,000	...	10	0
30 min.	140,000	...	500	0.3
45 min.	60,000	...	1,400	2.3
1 hr.	27,500	...	850	3.1
1¼ hr.	11,000	...	400	3.6

Influent B.O.D. = 300 p.p.m.

Effluent B.O.D. = 50 p.p.m.

oxygen consumed, and stability determinations were made to check filter efficiency during the period in which the filter-bed was built up. Palo Alto sewage is strictly domestic except for the waste from one cannery, has a high B.O.D., no D.O., and about 5 p.p.m. H₂S. The settled sewage had a B.O.D.

plied for 3 hours and counts made at frequent intervals. Over a 4 hour period typhoid numbers were reduced about 96 per cent. A 75 per cent reduction of the 260 p.p.m. B.O.D. was obtained.

3. Constant Dosing at Rate of 6.6 m.g.a.d.

Data secured in this experiment and listed in Table X are interesting for two reasons: (1) a 99 per cent reduction of typhoid organisms was secured, and (2) the correlation between effluent and influent *E. typhi* counts

* B.O.D. = biochemical oxygen demand
D.O. = dissolved oxygen
N. = nitrogen

† m.g.a.d. = million gallons per acre per day.

was very marked although the number of organisms varied considerably. The B.O.D. of 300 p.p.m. was reduced 80 per cent.

4. Constant Dosing at Rate of 12 m.g.a.d.

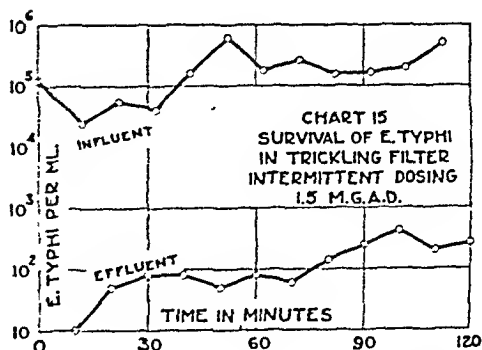
In a run at high dosing rate for 1 hour, it was surprising to obtain an *E. typhi* reduction of about 95 per cent.

5. Intermittent Dosing Cycle—Rate 1 m.g.a.d.—2 Minutes Dosing Followed by 6 Minutes Resting

In this experiment 5,500,000 *E. typhi* per ml. were added for 2 minutes and the filter operated on above cycle. The B.O.D. was 300 p.p.m. and a 75 per cent reduction was secured. *E. typhi* were recovered in the effluent in 0.1 ml. portions up to 1 hour and 6 minutes, but the highest count at any time was only 30 per ml. Composite samples collected at ½, 1, and 2 hour intervals contained only 10 typhoid organisms per ml.

6. Intermittent Dosing Cycle—Rate 1.4 m.g.a.d.—4 Minutes Dosing Followed by 6 Minutes Resting

A concentration of 650,000 *E. typhi* per ml. was added for 1 minute and effluent samples plated over a 2 hour period. The sewage B.O.D. of 350 p.p.m. was reduced 85 per cent. Viable organisms were recovered in 0.1 ml. portions in only 2 of 12 samples;



in none of the ½, 1, or 2 hour composite samples of the effluent.

7. Intermittent Dosing Cycle—Rate 1.7 m.g.a.d.—3 Minutes Dosing Followed by 3 Minutes Resting

E. typhi were added for 2 minutes in a concentration of 1,000 per ml. No recoveries were made in the effluent in 0.1 ml. portions. The sewage B.O.D. was 190 p.p.m. and a reduction of 80 per cent was secured.

8. Intermittent Dosing Cycle—1.5 m.g.a.d.—Rate—3 Minutes Dosing Followed by 7 Minutes Resting

To add typhoid bacilli to the sewage over an extended period during intermittent dosing, it was necessary to open and close the needle valve between the flask of organisms and the

TABLE XV

Survival of *E. Typhi* in Trickling Filter—3 Minutes Dosing, 7 Minutes Resting—Rate 1.5 m.g.a.d.

Time	Influent			Effluent		
	Temp. ° C.	pH	<i>E. Typhi</i> per ml.	pH	<i>E. Typhi</i> per ml.	Per cent Surviving
Start	24	7.2	125,000	7.8	0	....
10 min.	25,000	...	10	0.04
20 min.	55,000	...	50	0.09
30 min.	40,000	...	80	0.2
30 min. Composite	90	....
40 min.	160,000	...	80	0.05
50 min.	600,000	...	50	0.003
1 hr.	175,000	...	80	0.05
1 hr. Composite	30	....
1 hr. 10 min.	260,000	...	60	0.02
1 hr. 20 min.	150,000	...	140	0.09
1 hr. 30 min.	..	7.2	165,000	7.6	240	0.14
1½ hr. Composite	30	....
1 hr. 40 min.	200,000	...	420	0.2
1 hr. 50 min.	500,000	...	200	0.04
2 hr.	Inoculation stopped			...	260	....
2 hr. Composite	300	....

Influent B.O.D. = 270 p.p.m.

Effluent B.O.D. = 40 p.p.m.

pump each time the motor was started and stopped. *E. typhi* counts therefore varied considerably as shown in Table XV. A reduction of 85 per cent in the 270 p.p.m. B.O.D. of the sewage was obtained. Chart XV shows a consistent reduction of about 99.9 per cent.

9. *Intermittent Dosing Cycle—2.8 m.g.a.d.
Rate—5 Minutes Dosing Followed by 10
Minutes Resting*

In this experiment a B.O.D. reduction of 70 per cent was secured with a sewage strength of 400 p.p.m. The addition of

SUMMARY AND CONCLUSIONS

1. Use of the highly selective modified Wilson-Blair bismuth-sulphite medium makes quantitative studies of the behavior of *E. typhi* in sewage and sewage treatment processes possible.

2. Successful isolations of *E. typhi* in 1 ml. portions of raw Palo Alto sewage were made in several instances. The isolation of viable typhoid organisms in the sewage of a city having

TABLE XVI

*Survival of E. Typhi in Trickling Filter—5 Minutes Dosing, 10 Minutes
Resting—Rate 2.8 m.g.a.d.*

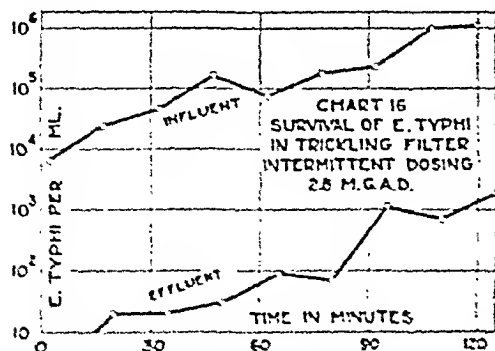
Time	Influent			Effluent		
	Temp. ° C.	pH	<i>E. Typhi</i> per ml.	pH	<i>E. Typhi</i> per ml.	Per cent Surviving
Start	24.5	7.3	6,500	7.8	..	....
5 min.	<10	....
20 min.	24,000	...	20	0.08
35 min.	45,000	...	20	0.04
50 min.	160,000	...	30	0.002
1 hr. Composite	40	....
1 hr. 5 min.	75,000	...	90	0.12
1 hr. 20 min.	175,000	...	70	0.04
1½ hr. Composite	60	....
1 hr. 35 min.	230,000	...	1,100	0.47
1 hr. 50 min.	1,000,000	...	700	0.07
2 hr. Composite	7.8	100	....
2 hr. 5 min.	7.3	1,100,000	...	1,850	0.16

< = less than

Influent B.O.D. = 400 p.p.m.

Effluent B.O.D. = 110 p.p.m.

E. typhi and the dosing cycle were manually controlled. Data in Table XVI plotted on Chart XVI show influent and effluent counts parallel with a reduction of about 99.9 per cent.



a high standard of sanitation and without having had an outbreak of typhoid fever in 30 years emphasizes the need for constant vigilance if effective barriers are to be maintained between infectious material and susceptible hosts.

3. The findings of early investigators on the longevity of the typhoid bacillus in sewage has been confirmed, it having been shown that a rapid decrease occurs for 3 or 4 days, after which survivors may persist for several weeks. The influence of temperature was noted as by other investigators, sur-

vival time being longer at lower temperatures.

4. Under conditions simulating a septic tank, it was found that 2 or 3 per cent of the typhoid organisms survived for 4 days both in the supernatant and in the mixed contents of the container. After the 4 day period, there were fewer survivors in the supernatant, though they were isolated in 1 ml. portions for 24 days. They were still found in 0.1 ml. portions of the mixed sludge, scum and supernatant through 27 days.

5. Experiments with activated sludge indicate that a reduction of 90 to 99 per cent in typhoid organisms can be expected during 6 hours aeration, and that in most instances only 1 to 3 per cent will survive. An experiment with activated sludge heated sufficiently to destroy or inactivate protozoa and non-spore-forming bacteria, indicated that biological activity and not aeration *per se* is responsible for the reduction in *E. typhi* in activated sludge. An increase of *E. typhi* occurred during 3 days of aeration of the previously heated sludge. A control batch showed a normally expected decrease during the same time.

No tests were conducted on the survival of *E. typhi* during the digestion of activated sludge.

6. In the studies herein reported, a trickling filter operating intermittently at effective rates up to 2.8 m.g.a.d. removed 99.9 per cent of typhoid organisms in sewage. Reductions of 96 to 99 per cent were secured at constant

dosage rates up to 6.6 m.g.a.d. and a 95 per cent reduction at 12 m.g.a.d. With alternate dosing and resting cycles, high concentrations of typhoid organisms were added for 1 or 2 minutes with but few viable organisms passing through the bed.

Considering the possibility of sampling errors involved in experimental work of this kind, the data secured seem surprisingly consistent and the curves of *E. typhi* counts in the influent and effluent are reasonably parallel, allowance being made for lag in passage through the filter.

It is apparent that two commonly used processes for secondary biological treatment of sewage, namely, activated sludge and trickling filtration, may be expected to reduce greatly typhoid organisms present in sewage, and are, therefore, effective barriers for the protection of public health.

REFERENCES

1. Jordan, E. O., Russell, H. L., and Zeit, F. R. The Longevity of the Typhoid Bacillus in Water. *J. Infect. Dis.*, 1:641, 1904.
2. Edwards, G. P. The Effect of Activated Sludge on Pathogenic Organisms. *Sewage Wks. J.*, 2, 2: 292-95 (Apr.), 1930.
3. Wilson, W. James, and Blair, E. M. McV. Use of a Glucose Bismuth Sulphite for the Isolation of *B. Typhosus* and *B. proteus*. *J. Hyg.*, 26:374, 1927.
4. Wilson, W. James, and Blair, E. M. McV. Further Experience with the Bismuth Sulphite Media in the Isolation of *B. Typhosus* and *B. paratyphosus* from Faeces, Sewage and Water. *J. Hyg.*, 31:138-161, 1931.
5. Ruchhofs, C. C. Studies on the Longevity of *Bacillus Typhosus* (*Eberthella typhi*) in Sewage Sludge. *Sewage Works J.*, 6, 6:1054-67 (Nov.), 1934.
6. Heukelekian, H., and Schulhoff, H. B. Studies on the Survival of *B. typhosus* in Surface Waters and Sewage. *Bull. 589*, New Jersey Agri. Exper. Sta., June, 1935.

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

June, 1938

Number 6

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

AN AMERICAN MUSEUM OF HEALTH

FOR nearly eight years the Association's Committee on American Museum of Hygiene has been moving steadily toward its goal, the establishment of the first of a series of permanent Museums of Health in this country. As is usual with those who advance new ideas and new methods, the committee has been forced to make capital of small gains and to work often without a great deal of encouragement. There are evidences now of their patient efforts coming to fruition.

The idea brought forward again and again by the committee is catching on—that the museum concept is readily adaptable to the education of the public in matters of health, that it provides a new and different approach to the problem of teaching the average man and woman the facts about their own physical organization, the personal application of medical and public health progress, and the way to better and more healthful living. The essence of the museum method of teaching is pictorialization and illustration, the capturing of dramatic facts which are now buried in verbiage in most of our health education programs and consequently remain misty abstractions in the public mind. It is, of course, the exhibit method on a grand scale, but the coördinated, unified exposition of man and his health at which the committee aims, moves into focus not a function nor an organ nor a specific health hazard as many health exhibits do, but the whole man and his environment.

The museum of health, as a new instrument for health education in this country, has passed successfully the acid-test of investigation of those who have money to give. The Oberlaender Trust, the Carnegie Corporation, and the Josiah Macy, Jr. Fund have considered the objectives of the Committee on American Museum of Hygiene worthy of financial support, thus giving great impetus to its work.

With the opening of the New York World's Fair, 1939, the public and the medical and public health professions will have the opportunity to see the first flowering of the committee's plans. A Medical and Public Health Building, the first ever to be set aside at a World's Fair in this country for exhibits in this field, is an important part of the exposition "Building the World of Tomorrow."

and for its existence the committee is largely responsible. The Fair was a challenge to the committee as a time and place to do a tremendously effective job in mass health education and at the same time to lay the groundwork for a permanent museum. The thought throughout in the development of the Medical and Public Health Building has been that the exhibits would be transferred at the close of the Fair to an American Museum of Hygiene. The New York City Administration has given assurance that a building will be available and the establishment of a permanent museum of this character in the United States may be confidently predicted.

The Medical and Public Health Building, therefore, will provide a preview of what may be expected to be seen in the American Museum of Health, which has recently been incorporated. It has developed to the point of adequate description.

The subjects have been carefully chosen with their easy visualization in mind and they will be treated with such simplicity that they will be readily understandable to the public. The entire exhibit is being arranged and will be conducted under the supervision and guidance of professional committees of medical and public health experts.

There are three major divisions in the Medical and Public Health Building. They will tell with scientific accuracy, yet with life, color and motion, the story of:

1. What man is—his anthropology, his ethnology, his anatomy and physiology—this in the Hall of Man.
2. The diseases and health hazards which modern man encounters and how medical science attacks and conquers them—this in the Hall of Medical Science.
3. How public health practices prevent disease and protect and promote community health—this in the Hall of Public Health.

There is no place in the Medical and Public Health Building for commercialism. The scheme of financing is as dignified as the project itself. No space as such is available, only the sponsorship of educational and scientific exhibits is sold. Of the sponsors, some are commercial firms of the highest ethical standing, approved by the medical and public health professions. Others are non-commercial groups or individuals actuated only by motives of service to the public. Among those accepted for sponsorship of various exhibits are: New York City Cancer Committee, Cancer; John B. Pierce Foundation, Hygiene of Housing; Eli Lilly & Company, Diabetes, Blood Diseases and Anemias; Cherry Burrell Corporation, Milk Control; Lederle Laboratories, Allergy, Pneumonia, Children's Diseases; Winthrop Chemical Company, Analgesia and Anesthesia; West Disinfecting Company, Occupational Infections and Sanitation; Ciba Pharmaceutical Products, Heart Disease and Endocrinology; Maternity Center Association, Maternal Health; Dorr Company, Water Supply, Sewage Treatment, Waste Disposal; Mrs. Henry Ittleson & Associates, Mental Hygiene; Queensboro Tuberculosis & Health Association, Tuberculosis; American Social Hygiene Association, Venereal Diseases, Gonorrhea and Sex Education; Parke, Davis & Company, Syphilis; American Museum of Health, Inc., Professional Club; Rockefeller Foundation and Rockefeller Institute for Medical Research, Virus Diseases, Infection, and Immunity.

The readers of the *Journal* who carry the banner for public health progress in this country may well keep an eye on the Medical and Public Health Building at the New York World's Fair and thereafter on the first American Museum of Health and lend their aid to the extension of the inherent and underlying

motivation of the whole plan to the end that similar institutions may be established in their own communities for the ultimate objective to which we are all pledged—a healthy and a health-conscious people.

WADE HAMPTON FROST

ONE of the best minds that have adorned the field of public health during this century has passed from us in the untimely death of Wade Hampton Frost.

His promising work in the old Hygienic Laboratory of the Public Health Service, his demonstration of a capacity to link together the data from the field and the laboratory, led to his selection for many notable investigations. These included among others some of the early intensive investigations of typhoid fever, poliomyelitis, especially the 1916 epidemic, the large septic sore throat epidemic in Baltimore, the direction of the Ohio River Stream Pollution Studies, and the Statistical Studies of the Influenza Epidemic of 1918–1919. To each of these he brought the ability to plan for the data he required, their classification and digestion, and, finally, to draw whatever conclusions his logical and critical mind would permit. These latter would be expressed in clear, incisive English that admitted of no misunderstanding.

It was but natural that with these qualities, the Surgeon General should have been requested to assign him as Lecturer on Epidemiology when the new School of Public Health was established at Johns Hopkins in 1919, to become Professor of that subject two years later. As a teacher he was outstanding. From among his students and especially from among those who remained for a time as his assistants will emerge the leaders of public health of the next generation. Indeed, some have already developed. His influence on their habit of thought, in arousing a passion for research and discovery, whatever their field of activity might be, in the development of honest thought and self criticism, cannot help having laid a wide foundation upon which will be built a stronger, straighter public health program for the future.

It was natural that as public health problems multiplied he was sought more and more for his counsel in projected ventures, for his criticism of methods and results, for his advice as to further action. Wherever hard, honest thinking was wanted, "Jack" Frost *wanted* to go. He could not answer all the calls on his time but to whatever he undertook he gave without stint, without thought of reward or public credit. His only requirement was that the work he did should meet his own high standards.

In the American Public Health Association Dr. Frost was a leading figure. Besides having served as chairman of the Laboratory and the Epidemiology Sections of the Association, he was for many years a member of the Governing Council. His independent thinking was many times in evidence in relation to Association policies, and his critical examination of proposed actions will be missed more than many members appreciate. This year he was awarded the Sedgwick Medal for distinguished work in public health. It was never conferred on one more deserving.

From a personal standpoint the following editorial from the *Baltimore Sun*

of May 3 expresses with a beauty beyond the capacity of this writer, the thoughts of those who knew and loved him well:

"One of the fine and rare spirits passed from this earth on Sunday morning in the death of Dr. Wade Hampton Frost. He was a distinguished figure in medical science. To his work his associates will give tribute in due course. But, with all gratitude for his notable professional services, it is of the man himself that those who knew him well will think in the hour of his departure. What they will think will be this: Wherever he stood, there knighthood remained in flower.

"His personality had many facets. He had deep wisdom for the affairs of life, and he had subtle and penetrating wit. He had an austere sense of duty and a fine instinct for leisure. He could be the Spartan and he could be the bon vivant. No matter which facet he turned to life, it shone as in the sun. No one can recall the mean or malicious as his contribution in any relationship. All who knew him recall at this time the thoughts and the acts that were generous and just, high of mind and mood. He made living a noble adventure.

"Those who were privileged to have his friendship find their sorrow embedded in deep thankfulness for his life."

GEORGE MILLER STERNBERG

JUNE 8, 1938, will mark the 100th anniversary of the birth of George Miller Sternberg, President of this Association in 1887. He was born at Hartwick, N. Y. He was graduated in medicine from the College of Physicians and Surgeons, New York, in 1880. At the outbreak of the Civil War, he was commissioned Assistant Surgeon and served with credit through that great conflict. He distinguished himself for courage and repeatedly served his soldiers under fire. At the Battle of Bull Run he was captured by the Confederates, but escaped. It is said that he saw more active service on the battlefield in the Civil War and in the Indian campaigns that followed than any other medical officer of his time.

After the War he went West and experienced the terrible epidemic of cholera at Ft. Harker, Kans., in 1867, from which he lost his wife. In 1873 and 1875 he went through yellow fever outbreaks at Ft. Columbia, New York, New Orleans, and Barrancas, Fla., which unquestionably aroused the interest which he showed throughout his life in this disease, and led to the many studies he made personally as well as to his appointment of commissions to study it. While stationed at Walla Walla, Washington Territory, he began studies on the practical value of disinfectants, work which was subsequently continued in Washington and at Johns Hopkins. In 1885 he was awarded the "Lomb Prize" for his essay on disinfection which was translated into several foreign languages, and went through three editions, the last published in *Public Health Papers and Reports* (Transactions of the A.P.H.A.), Vol. XXV, 1899, p. 624. For many years it was the leading work on disinfection in the English language.

In 1891 he became Lieutenant-Colonel Surgeon and in 1893, Brigadier-General Surgeon General. Under his administration many important advances were made. He was responsible for the creation of the Army Medical School in 1893, which is regarded by some as America's first and oldest school of public health and preventive medicine. On his recommendation, Congress created the Army Nurse Corps and the Army Dental Corps in 1898.

General Sternberg may be called the pioneer bacteriologist of America, accomplishing good work under the most adverse circumstances and with poor equipment. In 1881 he discovered what is now known as the pneumococcus, very soon after the same discovery had been made by Pasteur. Neither suspected the connection of this organism with pneumonia and it remained for Fraenkel, Weichselbaum, and others to clear up the situation. General Sternberg always carried the organism in his sputum and in those days it was known as the organism of sputum septicemia.

There is no doubt that he saw phagocytosis which, however, had been observed by three or four others before him, two of whom, Panum and Roser, advanced fair theories of what it meant, but gave no experimental evidence, and it remained for Metchnikoff to formulate the theory and prove it by experimental work. His first paper was given at the Naturalists' Congress in Odessa in 1883, published in *Arch. a. d. Zool. Inst.*, Wien, 1883.

General Sternberg was a pioneer in photomicrography and some of his pictures remain unsurpassed to this day. While on duty at Fort Mason, Calif., he demonstrated and photographed for the first time in America the tubercle bacillus. In New Orleans, in 1880, he studied malaria and proved that the organism claimed by Klebs and Tomassi-Crudeli as the cause of the disease had nothing to do with it. He was a delegate to the International Sanitary Conference in Rome in 1885, and on his return, demonstrated for the first time in this country the plasmodium of Laveran in the laboratory of Dr. William H. Welch at Johns Hopkins.

His interest in the etiology of yellow fever has been mentioned. His search for the specific organism began in 1879. He twice visited Havana and also Rio de Janeiro, Vera Cruz, and Decatur, Ala., during the severe epidemic of 1888, in his studies. It is claimed by his admirers that he cleared the road for the work of the Walter Reed Commission. He was responsible for the appointment of the Commission headed by Walter Reed, which in 1900 cleared up the etiology of the disease and proved the agency of the *Stegomyia* mosquito, as it was then called, as the carrier.

His writings were voluminous and he gave to America the first comprehensive textbook on bacteriology. His bibliography includes 143 titles on bacteriology, disinfection, infectious diseases, and public health. He was President of the American Medical Association and of the American Public Health Association (1887), and held honorary degrees from the University of Michigan, 1894, and Brown University, 1897.

His later life was spent in Washington, D. C., where he died in 1915 at the age of 77 years. He is buried at Arlington and his monument bears the following epitaph, prepared by Dr. William H. Welch:

Pioneer American Bacteriologist. Distinguished by his studies of the causation and prevention of infectious diseases, by his discovery of the microorganism of pneumonia, and scientific investigations of yellow fever, which paved the way for the experimental demonstration of the mode of transmission of that pestilence. Veteran of three wars, brevetted for bravery in action in the Civil War and the Nez Perces War. Served as Surgeon General of the U. S. Army for a period of nine years, including the Spanish War. Founder of the Army Medical School. Scientist, author, and philanthropist. M.D., LL.D.

NOTE: We are indebted to the Editor of the *Annals of Medical History* for a manuscript prepared by Lt. Col. Edgar Erskine Hume, for assistance in the preparation of this sketch.

SOME PUBLIC HEALTH ASPECTS OF HOUSING

AN issue of the *Journal* which carries a third article on the housing activities of the Memphis Health Department may appropriately call attention to the recognition by housing officials of the contribution made by the public health profession to current housing programs.

The National Association of Housing Officials has referred to "the growing concern of the public health profession with housing conditions and programs of recent months" as "a most encouraging development," and has given effect to this appraisal by distributing the report of the American Public Health Association Committee on the Hygiene of Housing* to all local housing authorities. An equally cordial reception of the public health viewpoint in housing has been shown by the American Federation of Housing Authorities. A statement recently received from Miles R. Frisbie, Executive Director of that Federation, stresses the importance of basic health records in planning a local public housing program, including the necessity for legal powers in the health department for the demolition of insanitary dwellings, and the practical contribution from the health viewpoint to the proper design of new housing projects.

Both of these national housing organizations have recognized the contributions of health departments to local housing programs in cities such as Birmingham, Schenectady, Hartford, and Chicago. Both have paid special tribute to housing activities of the department in Memphis. In that city, housing betterment by the Health Department has ceased to be a negative matter of dealing with scattered sanitary violations and complaints, and has become a matter of constructive "municipal housekeeping" in accordance with a long-range plan.

* *A.J.P.H.*, Mar., 1938.

NEWER KNOWLEDGE OF POLIOMYELITIS

WE are publishing on another page an article on poliomyelitis, bringing the history up to date. It is remarkable to note that with increasing years of study, doubt is taking the place of much we have considered practically proved.

Almost coincidentally is an unusually excellent article on the same subject,¹ which covers much of the same ground. We cannot do better than to quote the conclusions of this article, which in general are in entire agreement with those of the paper read at our annual meeting, and contained in this issue.

It is evident that much of the recent work on poliomyelitis has been destructive rather than constructive in nature—perhaps a healthy sign. At any rate at the present time, we must face the fact that the prospects of solution of the many puzzling problems of this mysterious disease in the immediate future are not bright. Until such a time as the epidemiology is thoroughly understood and until a simple method of determining the susceptibility to the disease has been found and definite specific prophylactic and therapeutic means for combating the disease have been discovered, it would seem that the lay public is entitled to share with us the realization of our profound ignorance of most of the essential facts of the disease. The premature publication of half truths has for years kept the public in a state bordering on hysteria and has thrown a tremendous and increasing onus on the practising physician.

REFERENCE

1. Landon, John Fitch. Poliomyelitis. The Present Status of Our Knowledge. *New York State J. Med.*, Jan. 1, 1938, pp. 1-6.

PUBLIC HEALTH EDUCATION*

They Aim to Please in Delaware
—To please and thus to attract and to hold attention, as told by L. C. Messick, director, public health education, Delaware Board of Health, Dover:

The Division of Public Health Education is conducted with the understanding that a project wins understanding allies and multiplies public cooperation with health programs. With this in view, informative releases are sent the newspapers, pamphlets offered to the public, a free quarterly magazine published, talks arranged before pertinent groups, motion pictures and illustrated sound lectures projected before service clubs, granges, P.T.A.s and similar gatherings.

The informative newspaper releases serve as the back-log of the program, tying together the other activities through furthering each and through consistently keeping the reading public acquainted with the work, plans, and accomplishments of the State Board of Health. It has been conservatively estimated that the weekly newspapers use an average of 88.5 per cent of the material sent them, and that the daily papers use 75 per cent.

To carry on this program of newspaper information, regular visits are made to the heads of the various sub-divisions of the State Board of Health, to seek out any newsworthy subjects in their work. When they have any specific plans, drives or projects in need of public attention, detailed programs of suitable publicity are prepared and submitted to them for approval, before being carried into effect. Occasional visits to newspaper editors aid in maintaining their interest and cooperation.

The *Delaware Health News*, published quarterly, is prepared with the belief that it must compete, in homes and offices, with news, fiction, and humor magazines of national distribution. As a result, the format has been entirely modernized, an extra color

used wherever appropriate (and in so far as budgets allow), emphasis given to designing effective front and rear covers, and considerable attention devoted to creating interesting page layouts. The mailing list includes all Delaware physicians, school teachers, ministers, members of the legislature, newspaper and magazine editors, and any others who request that their names be included.

Health exhibits are designed and installed at suitable gatherings, conventions and fairs. Each is so constructed as to make it readily portable and adaptable to almost any display position. In designing exhibits, smart colors, bright lights, and modernistic designs are used to alleviate any atmosphere of gloom and foreboding, and better to attract and hold attention.

Pamphlets and folders on various health subjects are designed for smart appearance, ready reference, and convenient preservation by the public. Pleasing designs and colors are utilized to draw attention, and all publications pertinent to the same subject are prepared on paper of the same color. Internal text arrangements are designed to facilitate rapid reading and ready reference. Included are pamphlets on the various diseases—diphtheria, syphilis, gonorrhea, tuberculosis, diarrhea and enteritis, diseases of children, typhoid fever—and precautions to prevent their contraction or further spread; pamphlets on the selection of menus with regard to economy and nutrition; pamphlets on the care of the teeth; pamphlets on mother and child care and feeding; pamphlets on home, farm, and swimming pool sanitation, and others.

Where suitable, and upon original publication, these booklets and pamphlets are distributed to a part or all of the mailing list; clinics, health centers and libraries are kept supplied with them thereafter, for placing in "free distribution" racks.

Briefly, this section of the State Board of Health endeavors to gain public cooperation and forestall criticism by explaining the motives of the other divisions of the board, and by educating the public in the wisdom of their plans.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Social Hygiene Racketeering—“Hangers on the Social Hygiene Bandwagon” are described in *Bulletin*, Massachusetts Society for Social Hygiene, Little Bldg., Boston, Mass. Jan., 1938.

The widespread publicity concerning the present campaign to stamp out syphilis has called forth an increasing number of scheming promoters who wish to cash in on the national anti-syphilis program and who are setting up here and there “social hygiene organizations” for which they are soliciting funds. We have no quarrel with those whose sincere interest in the subject moves them to set to work and to utilize straightforward, approved and scientific methods in their work.

It must be admitted, however, that there are many men who with an eye to the main chance will climb on any bandwagon provided it is steadily going somewhere and proceed to gather in the shekels for themselves. It is against individuals of that ilk that this warning is directed. The recipient of any appeal for money to help in the campaign to stamp out syphilis will do well to investigate the source of the appeal. . . .

Then is quoted the *Journal of A.M.A.*:

At this time, any new organization in the field of social hygiene should be scrutinized with care; to make sure not only that it is free from racketeering possibilities but also that it has sponsorship which gives reasonable assurance that funds entrusted to it will be expended wisely and in the public interest.

The Health Department Library—We give below a picture of the New York City Department of Health Library. Not many cities will have a real, trained librarian, but the atmosphere and the range of resources may well be duplicated in numerous cities. *What are the characteristics of a desirable, helpful department library? What other characteristics have been noted by the traveling representatives of state or national health agencies?*

This Job of Ours describes the New York City Library:

A library in charge of expert librarians is an advantage very few health departments enjoy. Our library, located in commodious quarters on the second floor, is a branch of New York's Municipal Library. You are welcome to use the library whenever you need it. If you want help in looking up particular subjects, you will find it generously offered. All employees are entitled to the privilege of using the library.

On the shelves are many treasures not easily found elsewhere. Practically all the standard books on public health are there, besides complete reports of the department since its organization in 1867. Among the authors represented are a number of our own, past and present, health department staff members.

Seventy-five periodicals, including 7 from foreign countries, are regularly received. After circulation among staff members who wish to see them in their offices, they are placed on file. Comfortable chairs and pleasing surroundings add to the pleasure of browsing or spending a noon hour there or doing research reading. Books and periodicals may be taken home by arrangement with the librarian.

A new service the library soon hopes to inaugurate is that of supplying recent reprints and pamphlets on subjects of current interest, such as—pneumonia, syphilis, child hygiene, and so on. Selected publications will be collected and kept in stout envelopes according to subject. These “Package Libraries” will be mailed to employees who ask for them on a loan basis. The packages will be kept up-to-date. If this service proves popular, we hope to expand it.

County Nurse Hits the Bull's Eye—County Nurse Gertrude M. Clouse tells about “Publicity in Public Health Nursing” in *State Board of Health Bulletin*, Madison, Wis. Oct.-Dec., 1937.

Miss Clouse has the big idea for effective newspaper publicity (our italics):

The public is so many times swayed by propaganda. Why, then, shouldn't one get the right propaganda before them? That was the way I felt about my newspaper publicity. I wanted so much to get the people public health minded.

Consequently each of my articles was current in subject matter and grew out of a

dire necessity to get that topic before the public at a time when their interest in that topic would be keenest and would do the greatest good.

Do You Know What to Believe?

—Or, do you know what is propaganda, and what is not? Don't ask us what is propaganda, or why we should be able to recognize it. Those two questions must be answered another day.

However, many of our readers and others believe that propaganda is responsible for many questions to be studied with care. And public health educators need to learn how *their* propaganda stacks up with the propaganda from other sources far too numerous even to list.

The Institute for Propaganda Analysis (132 Morningside Drive, New York, N. Y.) has been formed to "help the intelligent citizen detect and analyze propaganda. The Institute

... is a non-profit corporation organized for scientific research in methods used by propagandists in influencing public opinion. It will conduct a continuous survey and analysis of propagandas. By objective and scientific scrutiny of the agencies, techniques, and devices utilized in the formation of public opinion, it will seek to show how to recognize propaganda and appraise it.

The Institute issues a *Monthly Letter* for those who

... desire periodic, objective appraisals of today's propagandas, their sources and the channels through which they flow: newspapers, magazines, radio stations, motion pictures, labor and business groups, patriotic societies, farm organizations, schools, churches, political parties.

The board of directors is made up of university and college professors, including names known to all of us, and two or three others. Some readers will wish that they had broadened the base of responsibility for the project.

Membership is \$2.00 a year, to start Oct., 1937, or later, as one may desire.

At least write for information and samples. If you are interested in propaganda in schools they will tell you about special plans and materials.

Basic to Success Against Cancer
—"Educational Methods and Cancer."
Bulletin, American Society for Control of Cancer, 1250 6th Ave., New York, N. Y. Nov., 1937. Develops the following points:

"The first point to bear in mind is the *mental attitude* of the person to be educated . . . Second among the important principles of cancer education is the *complex nature of the process of diagnosis and treatment* . . . A third important point to be remembered is the *nature and degree of complexity of the information to be transferred* . . . Finally comes the question of the *duration of education effort* . . . The enlistment of hundreds of thousands of individuals who are known, organized, directed and continually aroused is the only way. The control of cancer requires the establishment and maintenance of a *point of view which must become an integral part of the daily lives of those who would survive.*"

A Comprehensive State Health Education Program—Later in the season we hope to present the plan in detail. This month we quote from the introductory statements in "Kentucky's Plan for Public Health Education," by Dr. A. T. McCormack and Reba F. Harris, in *Public Health Reports*. Oct. 29, 1937. 5 cents. Supt. of Documents, Washington, D. C.

Since approximately 70 per cent of all public health work has its basis in education, it becomes imperative that more time and thought be given to a well organized plan of public health education. Social Security funds have enabled the Kentucky State Department of Health to set up such a functioning plan.

This plan is based on the point of view that public health is concerned not only with saving lives of human beings, but also with guiding them to learn how to live healthfully and effectively in their daily environments. This guidance becomes more effective with the understanding of the facts that specific health problems arise within certain age

groupings, and that health hazards exist under certain environmental conditions. . . .

Kentucky's new plan of public health education, therefore, is based not upon artificial publicity devices, but upon a better understanding of the health needs of human beings in the various age groupings as they react to each other within the respective environments in which they live. This will be recognized as the ecological approach to public health education.

The first step toward the application of this approach is an efficient corps of public health workers who render all services in an educative way; for, whether it be through emotional appeal or reasoning, the activity or procedure in itself provides the greatest possibility for catching the attention and thereby places the individual or group in a receptive frame of mind for the operation of the learning processes. In other words, a community of both adults and children will understand more readily the values of a safe milk supply if facts concerning its own present supply, and the inherent dangers, are presented for study and discussion at the time the community leaders are planning changes or improvements in such supply. . . .

That the activities and procedures involved in the generalized program of public health in Kentucky may become forces for education in the lives of her people, the Kentucky plan for public health education, coöperatively formulated by all members of the State Department of Health staff, begins with the continued learning, or in-service education, by the two major groups of people who are actively engaged in public health work: namely, (1) The administrative and staff members of the State Department of Health, and (2) personnel of the coöperating county and city health departments.

Through these two major coöordinated groups, the plan extends to the leaders of the organized forces for social betterment and to the public in general within the state and local communities; for it is that group of workers—public health physicians, public health nurses, and sanitary instructors—who are charged with the responsibility of bringing to a greater number of leaders in all phases of social betterment—health, welfare, education, religion, social economics, as well as farm and labor organizations, women's clubs, and bar associations—a better understanding of the values of public health protection.

Then follows "The Functioning Plan" based upon 3 committees and the detailed plans for their direction:

Committee on Continued Learning by State Staffs . . . Committee on Continued Learning by County Unit Personnel . . . Committee on Continued Learning by the Allied Groups.

We have requested a progress report on the first 12 months of experimental work under this plan, to be published in an early summer issue, along with the full outline of the plan.

When You Come to New York—
You will, of course, find most of the national health agencies at 50 W. 50th St., in Rockefeller Center.

Right in the same building is the Museum of Science and Industry, a "must" on the calendar of any one interested in the exhibit form of presentation.

Incidentally, the one best aid to the visitor in Manhattan is the weekly *Cue* (6 E. 39th St.) to be found on news-stands. This will give the maximum of dependable information about plays, pictures, music, dining, and other recreation features.

• **What Life Did—**Says an editorial in *Editor And Publisher*, journal of the newspaper world (April 9, 1938):

A bit ahead of the procession may be *Life* magazine in its picture sequence, published April 11, depicting the birth of a baby. The motion picture upon which the feature is based has run into the opposition of Mrs. Grundy in several cities, and *Life* undertakes more than the normal publishing risk in devoting its central four pages to the story.

Both the film and the *Life* sequence are done with the utmost delicacy, but with the complete eradication of the stork and cabbage leaf fables that used to be fed to the youth of the land. No youngster who gets hold of this copy of *Life* will ever be in any uncertainty as to how he arrived in society, and the way is laid open for diffident parents to reveal what the magazine omits.

Recognition of the dynamite that still inheres in any public treatment of the mystery of generation is seen in *Life's* letter to its 650,000 subscribers. It explains the feature, quotes endorsements from numerous educators, physicians, and editors, and points out

that the four centre pages can easily be removed from the issue if parents don't want their children to learn the facts of life that way.

For our part, and from considerable experience as a parent, we can point to no better channel of education than pictures selected by an editor with a sense of decency, balance, and intelligence. These qualities have not always been evident in picture magazine treatment of similar subjects, some of which have been called to our attention as a father and not as an editor. The temptation to the low-minded is always to tickle the itchy-minded reader, and while you can get circulation that way, you also invite censorship. *Life's* job may not win any new circulation, but it ought not to lose any—and it is certainly no bid for the exercise of blue pencils.

SAFETY

"Death Begins at 40" is the 1938 issue of the highly original annuals issued by Travelers Insurance Co., Hartford, Conn. There are 40 pages of striking text and illustrations against death by careless drivers. The pamphlet is offered for free distribution, and the facts and illustrations may be reprinted. We hope to see some of the material reprinted in many health bulletins. Suggestion: Your reproduction will be more effective if you don't try to copy the red initial letters and the confused typography of some of the pages.

"1938 Accident Facts: Preliminary Edition" contains a wide range of accident facts and figures for 1937. The final and complete edition will be

issued in June. In the meantime the "Preliminary" will be supplied by National Safety Council, 20 N. Wacker Drive, Chicago, Ill. *Free.*

"A Matter of Life and Death," by I. A. Booker. *Journal*, N.E.A., 1201 16th St., N.W., Washington, D. C. Oct., 1937. 25 cents. Safety in education; source material.

"The Nurse Stimulates Employee Interest in Safety," by E. Augustus. *Public Health Nursing*, 50 W. 50th St., New York, N. Y. (date?)

"The Prevention of Home Accidents," J. Melpolder. Includes popular education and group discussion. *Public Health Nursing*, 50 W. 50th St., New York, N. Y. Feb., 1938. 35 cents.

"Safety Education" is a section of "A Guide to the Teaching of Health in the Elementary School." University of State of New York, Albany. Teaching materials; children's activities; references for teachers and for children; sources of inexpensive and free safety materials.

"A Short Story of Organized Recess" describes a plan for securing a safe recess for school children. *Safety Education*, 1 Park Ave., New York, N. Y. Feb., 1938. 10 cents.

"Two Thousand Infants Killed Annually in Accidents." *Statistical Bulletin*, Metropolitan Life Insurance Co., New York, N. Y. Oct., 1937.

BOOKS AND REPORTS

Approved Laboratory Technic—
By John Kolmer and Fred Boener
(2nd ed.). New York: Appleton-
Century, 1938. 893 pp. Price, \$8.00.

It is apparent that the original purpose of the manual, to standardize various laboratory examinations and to make clinical pathology increasingly applicable in the diagnosis of disease, is well maintained. The book is the result of the work of 28 collaborators who are the originators of methods themselves.

The manual covers the extensive and ever-widening field of clinical laboratory methods in a clear, complete, accurate, and concise manner. The book has been revised, and enlarged with the addition of many new methods in keeping with the rapid advance of work in this field. References are given for those who are interested in doing further study and collateral reading. Five new chapters have been added: (1) On the methods for hormonal diagnosis of early pregnancy, hydatiform mole, chorion-epithelioma and teratoma of the testicle. Although brief, it covers the essential steps in the laboratory diagnosis of these conditions. Six references are given to original papers. (2) On the laboratory diagnosis of disease produced by yeasts and fungi. This serves as an aid in the usually difficult diagnosis of mycological diseases. Numerous illustrations are included. (3) On the diagnosis of parasites producing disease of the skin and mucous membranes supplemented with illustrations. (4) On methods for conducting tests for allergy. Methods are given for the preparation of allergens and the technic of various skin tests. The technic of the Frei test and the preparation of

the antigen is given. (5) On histological methods and the preparation of museum specimens. This contains much easily readable and useful information on the organization and operation of a laboratory for the microscopic diagnosis of tissues. Many special staining methods are given.

The text is well indexed.

W. D. STOVALL

Experimental Studies of Water Purification—By H. W. Streeter, Frederick J. Moss, C. T. Wright. Reprints Nos. 1114, 1170, 1392, 1434, 1565 from *Public Health Reports*. Washington: U. S. Government Printing Office, 1938. 96 pp. Price, \$25.

Brief Abstract—The six reports included within this binding deal with a series of experimental studies of modern water purification methods which were made over a period of about 6 years in 1924–1929 at the Stream Pollution Investigations Station of the U. S. Public Health Service at Cincinnati, utilizing a large-scale experimental water filtration plant.

The first report contains a description of the experimental plant. The second and third reports deal with results of the first 15 months of operation and with certain relationships between the quality of influent and effluent studied in this connection. In the fourth and fifth reports, results are given of observations on the efficiencies of purification obtained with certain modifications in rapid-sand filtration treatment, such as pH adjustment, increased coagulant dosage, prolonged sedimentation and prechlorination, involving no material changes in the design or construction of existing plants of

the same type. In the sixth and concluding report, the results of the experimental studies are summarized and compared with those of two field surveys of 31 municipal water purification plants, reported in *Public Health Bulletins* 172 and 193.

Two by-products of the studies have been (1) the establishment of a fundamental relationship between the densities of pollution of influent and effluent waters governing all water purification processes observed, and (2) the derivation of some new data bearing on the practical efficiency of various processes of purification and the extent to which this efficiency may be modified by certain physical conditions, some controllable and others non-controllable by the plant operator. The influent-effluent relationships established may be applied to determining limiting degrees of raw water pollution consistent with the production of effluents of any desired quality. H. W. STREETER

Report of Investigations of the Typhoid Fever Epidemic, Minneapolis, 1935—By the Minnesota Department of Health, Minneapolis, Minn., 1938.

In 1935 there was an epidemic of typhoid fever in Minneapolis, Minn., covering 98 days, beginning the first half of May and running until the early part of August. During this time there were more cases of typhoid (175) than had been reported for the previous 6 years.

The *Report of Investigations* has just come to hand. It is well done, thorough, and carries also research work on the comparative resistance of different strains of typhoid and other intestinal bacteria to varying amounts of residual chlorine.

The report is divided into three parts, the first of which gives the epidemiological studies and conclusions as to the source of the epidemic, the second

covers the investigation of the Minneapolis water supply, and the third the research studies mentioned.

The conclusion is reached that of the persons who suffered from typhoid fever, 159 had used water from the Fridley zone in the home, at work, or elsewhere, and that 15 more had used water from the "mixed" zone carrying in part water from the Fridley plant.

In the latter respect this epidemic is not unlike the one which recently visited Croydon, England, in which an otherwise good water supply was infected by one well on which construction work was being done.

The report is well documented and contains a wealth of charts, maps, and figures. Altogether it strikes us as being a very valuable investigation, and unusually well done. It will be of interest chiefly to health officers and to water engineers.

MAZÛCK P. RAVENEL.

Report on Eighth International Congress of Military Medicine and Pharmacy—By Captain William Scamman Bainbridge, M.C.-F., U.S.N.R., Ret., Department of State. Washington, D. C.: Government Printing Office, 1937. 114 pp. Price, \$1.00.

The Eighth International Congress of Military Medicine and Pharmacy met in Brussels, Belgium, June 27–July 3, 1935. The first Congress met in Brussels in 1921, and subsequent meetings were held each second year in Rome, Paris, Warsaw, London, The Hague, Madrid, and Brussels. The Eighth Congress was attended by 10 delegates from the United States of America under the chairmanship of Major Robert U. Patterson, formerly Surgeon General of the United States Army, representing the Army, the Navy, and the U. S. Public Health Service. In all 39 countries were represented by official delegations composed, in most instances, of medical

officers from the Army and Navy of the respective countries. All the major powers were represented at the Congress.

The *Report* of the Congress deals, for the most part, with certain subjects which were officially reported upon in accordance with the agenda of the Congress. These subjects are:

I. Principles of organization and functioning of medical services in mountain warfare

II. Determination of fitness for the different specialties in armies, navies and air forces

III. The post-traumatic abdomen

IV. A study of the standardization of methods of analysis of food-stuffs for military use

V. Bucco-dental service at the front

VI. Comparative study of the functions of the administrative medical services of armies, navies and air forces

The report as written comprises 111 pages of text. Generally, the material presented is of a highly practical nature and the conclusions reached are those based upon the experience of various medical officers serving in the different armies of the world. The report is of such a nature that it cannot be adequately summarized here, but it should be read by all those interested in military medicine.

G. C. DUNHAM

How To Be a Convincing Talker
—By J. George Frederick. New York: Business Bourse, 1937. 2 vols., 131 pp. Price, \$3.50.

Here we may learn much about talk as a tool—how to get along with people in talk, and how to talk them into doing what we want them to do. There are hundreds of books on public speaking, debate, and related topics. I am not prepared to compare this book with others more or less in the same field, but here we have easy to read working ideas, with numerous illustrative examples, which seem to be usable by many *Journal* readers. It is about talk-

ing, about public speaking, and about listening, too. The application of what is said under "Fallacies about Speeches" and "Care and Responsibility with Speech Material" would change many a convention and meeting program. It is a book to be examined before passing it up. In all of the professions there is increasing recognition of the importance of talk and of public speaking. EVART G. ROUTZAHN

Latent Syphilis and the Autonomic Nervous System—By Griffith Evans (2nd ed.). Baltimore: Wood, 1937. 158 pp., 50 plates. Price, \$3.00.

Noting that the accepted modes of diagnosing syphilis—demonstration of the spirochete, serological tests, and pathognomonic lesions—are not wholly applicable to the diagnosis of latent syphilis, the author pleads for a more detailed analysis of family history and for more frequent recourse to the therapeutic test as supplementary criteria for diagnosis. He then levels suspicion at a train of syndromes attributed to autonomic dysfunction.

Starting from the observation that secondary syphilis entails a generalized lymphadenitis and that the autonomic nerves bear an intimate relationship to the paravertebral lymph chain, the author considers that a definite proportion of diseases of the thyroid, asthma, angioneurotic edema, purpura blanching of extremities, congestion of extremities, and claudication result from syphilis.

The author has not been very critical in his choice from the literature of evidence supporting his hypothesis. He accepts as proven the theory that the spirochete has a granular form and that infection may be congenital in the third generation.

The book will be read with some skepticism by those who have been trained to "deplore a facile assumption of a diagnosis of syphilis." Its chief

merit is that it raises the present rather low level of suspicion with regard to latent syphilis, even though it fails to convince the reader that the suspicion is directed along the proper channels.

RALPH E. WHEELER

Integration, Its Meaning and Application—*By L. Thomas Hopkins and Others. New York: Appleton-Century, 1937. 315 pp. Price, \$2.00.*

This volume represents an exploration of the subject of integration by a committee composed of leaders in the fields of art, biology, philosophy, psychiatry, psychology, and sociology. The first 9 chapters deal with the principles and ideas of integration, while the remaining 5 chapters describe and evaluate practices under various types of school curricula.

Integration is described as a short-hand word used to designate intelligent behavior, the process of integrating referring to continuous, intelligent, interactive adjusting. In the biological field, study of human integration indicates that the human body is the physical stuff from which all of human activities are derived. From the psychological and psychiatric clinic evidence is suggested to show that the personality is so closely bound up together that events which may seem to be far apart in time and quality may nevertheless unite in bringing about a given action. Furthermore, the interaction with society, integration within a culture of an individual influences human characteristics.

Basic conditions are outlined which must be borne in mind in planning a program of education designed to promote the maximum integrating behavior of normal individuals or in reeducating those who are now abnormal. Recently, it is noted, the movement in course of study construction has been away from the subject-curriculum type toward the experience-curriculum type. Since

courses of study affect the experience of pupils and teachers in the classrooms and in life outside the school, the belief is expressed that "These changes must be aiding them to achieve more integrating behavior in all of their interactions with their environment." This book is an interesting reference volume for those engaged in health education.

IRA V. HISCOCK

How To Use Pictorial Statistics—*By Rudolph Modley. New York: Harper, 1937. 186 pp., ill. Price, \$3.00.*

This is a readable book—the result of the writing, the large type on an open page, and the numerous reproductions of examples. The author, a former student of Dr. Neurath, is executive director of Pictorial Statistics, Inc., 142 Lexington Ave., New York, N. Y.

We have had enough bad examples of pictorial statistics to make it important that this book be read by anyone who starts to use the method. No technic can be "learned from a book" without trial and error. But this book should reduce the "error" element.

Happily, the National Tuberculosis Association and a few other groups are making it possible to have in this country fresh examples of the work of Dr. Neurath. However, it cannot be that no others may become practitioners in pictorial presentation, nor that all practitioners should subscribe to the inflexible form laid out by Dr. Neurath. Says Mr. Modley:

Any book which attempts to deal with the method of pictographs must acknowledge its indebtedness to the genius of Otto Neurath. He more than any one man created that method and made it into a significant tool of communication. This makes it more regrettable that Dr. Neurath has not found it possible to follow what seems to me the inevitable trend in the development of pictographs. I hope that the success of our American experiments will convince him that the restrictions he has set up are not fundamental implications of the method.

The crux of our difference of approach lies in our different interpretation of the character of the symbols. Dr. Neurath holds firmly to the belief that pictorial symbols should be international, designed within rigid limitations so that a pictorial Esperanto will be created. He wishes to circumvent a pictorial Tower of Babel and produce at once an international picture language. With that ultimate aim I heartily agree, but I believe his method of achieving it is Utopian.

I believe that pictographs must gradually be accepted as a tool of communication. To achieve this, the symbols must first grope their way into the consciousness of a restricted national audience. They must speak in terms which are comprehensible. Obviously, such symbols must be prepared with their specific audience in mind.

The American and the Chinese farmer dress differently and use different tools; the symbol for "farmer" in America will, therefore, vary from the symbol of "farmer" in China. When national schools will have developed to a point at which they are generally accepted in their countries, then the time will have come to combine the best features of each to create an international picture language.

The book also brings out experimental adaptations of the pictorial method in other directions than the diagram of comparisons: the expression of ideas, the illustration of processes or procedures. Then the use of pictorial material in exhibitions, and in museums receives attention.

Not all of the work of Dr. Neurath or of Mr. Modley is unquestioned. Probably both would more often reach 100 per cent if their tentative layouts were tested on a few people outside their own organizations. Particularly are they liable to add a touch of confusion through the addition of what is likely to seem to be ornament, but which is intended to be explanatory.

"The explanatory pictures serve only to indicate the field to which the symbols apply, or to explain some of the qualifications."

The weakness is that they may neither indicate nor explain. A symbol is not a symbol to another mind until its significance becomes clear. Simple

English words are better than a symbol which slows down the understanding of what follows.

Anyway, we owe much to Dr. Neurath, with his pioneering persistence and his fine sense of color and design, and to Mr. Modley for his effective job of Americanization.

EVART G. ROUTZAHN

Report on the British Health Services—By Health Group of PEP.
London: PEP, 16 Queen Anne's Gate, 1937. Price, \$3.00.

This is a notable book primarily because it represents Great Britain's first attempt to present a comprehensive picture of her health services together with her contemporary problems. In a general manner the organization and functioning of health services is examined and occasional proposals are made for future development of health services. As a rule, however, proposals for future development are vague and indefinite, reflecting perhaps the influence of anonymity with which PEP work is conducted.

No doubt much detailed precise information was used in compiling the report and in arriving at general principles which should govern future improvements. It seems to the reviewer unfortunate, however, that so little precise data were incorporated. Perhaps the material available to those preparing the report accounts for this, as many of the tables presented are not clear. The report points out that prevention of much unfitness can come from a study of social and economic factors, but seemingly fails to appreciate that a study of administrative machinery and of organization can contribute very distinctly to the production of health by bringing about a more effective utilization of health facilities. Only 5 pages are given to a description of the complex administrative machinery surrounding British health services. Resources of

personnel and of money are likewise very incompletely pictured.

First consideration is given to provisions for impersonal protective services and regulation of the environment. Overcrowding and slum conditions have led to State-assisted building programs for elimination of the worst slums. Decentralization of industry is considered one of the most essential moves to offset many of the factors favoring overcrowding and unhealthy environmental conditions. Sanitary facilities—water, sewerage, and scavenger services—are generally adequate in most urban areas but often inflated in costs by the division of suitable areas into several jurisdictions which are not inclined to act as one administrative unit.

Comparatively little development has taken place for the improvement of working conditions in industry. Regulations are often lacking and standards of safety and health if present are very low, with the result that a heavy burden of sickness and accidents occurs. PEP does not offer any concrete proposals which would modify this situation appreciably. Administratively the regulation of industrial health is largely divorced from general health administration.

Trade in food and drugs is for the most part uncontrolled. Laws pertaining to food are administered by local authorities with varying degrees of zeal. Milk-borne epidemics are not infrequent and much control is needed over food composition and quality. A more serious matter is the unrestricted advertising of health foods and drugs, whereby the consumer's health is exploited with exaggerated, misleading, and false claims.

The section on infectious diseases points out that vaccination against smallpox has been compulsory for 60 years but because of loopholes in the law little more than a third of the children are protected. The situation

with reference to diphtheria is so appalling that one cannot avoid questioning the accuracy of the figures presented. According to one of the tables, in 1933 and 1934 there were 59 diphtheria deaths per 1,000 boys, ages 2-5, and 55 diphtheria deaths per 1,000 girls, ages 2-5. It is stated that diphtheria immunization has not found general adoption, and its value is still questioned by some of the profession in Scotland.

Death rates during the first week of life and during the maternity cycle have shown the same resistance to decline found in the United States. Maternal mortality rates are consistently lower in England and Wales, where midwifery is frequently practised, than in Scotland where a greater proportion of births are delivered by physicians. From 5 to about 40 per cent of births occur in hospitals. In addition to the usual provision of clinic centers and health visitors for mothers and children, day nursery schools are operated by a few local authorities. Cash benefits are given mothers who are insured or whose husbands are insured in the National Health Insurance scheme. School health programs are administered by local educational authorities. The nutrition of the working classes, and particularly of mothers and children, constitutes a major health problem since the dietary is quite unsatisfactory. One chapter alone is devoted to nutritional aspects of health and to measures for improving nutritional status. Several concrete proposals are made, one of which is a subsidy to lower the prices of essential foods to make them available to those unable to afford a proper diet. Emphasis is given to the need for a marked expansion of the consumption of liquid milk. To a large extent the nutritional problem has its origin in low income but much of it arises from ignorance of food value on the part of the consumer.

A large section of the report deals with the medical profession and its ancillary workers, with National Health Insurance, hospital and institutional facilities, and special services.

One of the main problems of medical care is to improve the quality of general practitioner services and to extend them to an overwhelming majority of the population. An increasing tendency of patients to choose specialists in preference to general practitioners is ascribed to the poor quality of care frequently given by the latter class of doctor. It is recognized that the general practitioner's decline and the resort of unadvised persons to specialists is symptomatic of the inability of doctors practising general medicine as separate units to meet the standard of care dictated by modern medical needs. Even so, PEP proposals give little reason to expect the situation to improve. Institutional and hospital services are handicapped by overcrowding and inadequacy of organization and equipment. Some correction of this condition it is thought should accompany a strengthening of the position of the family physician who should be able to prevent unnecessary resort to hospitals and to reduce the need for institutional provision. How this strengthening is to be brought about is obscure but presumably is related to opportunities for refreshing the practitioner's knowledge. Refresher courses are arranged by a number of schools and by some divisions of the British Medical Association. Recently the Minister of Health has made plans for refresher courses to insurance practitioners by money grants. Five years must have elapsed since registration and a minimum number of insured patients must be on the practitioner's lists in order to be eligible for a grant. In this connection it appears that the need for refreshing the knowledge of public health personnel has been overlooked.

The shortcomings of National Health Insurance and the arguments against this scheme are discussed. An important defect will be remedied by an expansion to cover dependent family members of insured persons and inclusion of services of specialists. Administration costs constitute an important disadvantage of the insurance principle. In addition there is the objection that a proper overhauling and combining of all medical services is hindered by the scheme. A public medical service organized along with all public health activities supported from general taxes offers lower administrative costs and a more effective service. In spite of this, however, an extension of the health insurance is recommended.

The report, written largely from the authoritative viewpoint in which statements unsupported by quantitative evidence are frequently made, contains nevertheless useful information for the student interested in obtaining a cursory description of the interplay of British services.

PEP will dispel any doubt in the minds of those who feel that conditions of general well-being in the United States are unfavorable in comparison with those of Great Britain. Apparently the British attitude is to "hit upon" rather than to develop measures fostering health. The reviewer cannot escape the feeling that despite Great Britain's more comprehensive statutory provisions for the relief or prevention of ill health, she lags far behind the United States, largely because there has been lacking a dynamic attitude permitting necessary changes to be effected in the social machinery for the better adjustment of forces producing health.

J. O. DEAN

Third Symposium on Silicosis (Saranac Lake)—*Edited by B. E. Kuechle. Wausau, Wis.: Employers'*

Mutual Liability Insurance Co., 1937. 266 pp., paper. Price, \$3.00.

The papers and discussions in connection with this symposium, held at Saranac Lake, N. Y., June 21-25, 1937, are edited, as in the case of the two previous reports, by B. E. Kuechle.

The report comprises the following: Introductory remarks and the significance of the silicotic problem, by Dr. L. U. Gardner (3 pages); etiology of silicosis, by Dr. R. R. Sayers (2 pages), and by Dr. Sayers and Dr. R. R. Jones (19 pages with bibliography); dust concentrations and their measurement, by Prof. Philip Drinker (8 pages); pathology of the pneumoconioses, by Dr. L. U. Gardner (48 pages); physiology of the fibrotic lung, by Prof. W. S. McCann (13 pages); roentgenologic aspects of the normal and silicotic lung, by Dr. E. P. Pendergrass (14 pages); roentgenologic diagnosis of silicosis, by Dr. H. L. Sampson (20 pages); the clinical picture and diagnosis of silicosis with consideration of disability, by Dr. A. R. Riddell (10 pages); control—medical aspects, by Dr. A. R. Riddell (9 pages); control—engineering aspects, by Prof. Philip Drinker (7 pages); administrative aspects of silicosis, by D. E. Cummings (10 pages); and legislative control and compensation, by T. C. Waters (17 pages). Several pages of discussions follow each paper as a rule. A table of contents, a few illustrations, tables and charts, and a brief index complete the volume.

The wide reputation of the various contributors as specialists in their respective fields speaks for the high character of the context, which with careful editing of the discussions renders the volume indispensable to a large group now interested in the pneumoconioses.

As these succeeding annual symposia reports appear it may be seen that American experience is rapidly accumulating on this important subject, while general agreement on many features

is gradually assuming form; yet there are still many problems to be solved, which will come as the result of continued observations and critical studies, particularly upon the chemical, physiological, and infectious nature of the various lung-dust-diseases, and a protracted observation of the progress of cases and methods used to control and prevent them.

There is no doubt a correct feeling among Americans that the question of silicosis and other lung-dust-diseases should be worked out in connection with the characteristics of our own industries and employment methods, since much of the experience from abroad pertains to special conditions such as those occurring in the deep gold mines of South Africa, which do not exist with us. Fortunately many institutions, industries, and individuals are now hard at work upon the problem in the United States and in Canada.

EMERY R. HAYHURST

The Rat and Ratproof Construction of Buildings—By B. E. Holsendorf. Supplement No. 131, Public Health Reports. Washington, D. C.: U. S. Public Health Service, 1937. 68 pp. Price, \$.15.

This publication of the Public Health Service designates the rat as "Public Enemy No. 1" among animal pests. The rat, probably equaling in number the human population, destroys property of many kinds, and runs up an individual board bill of about \$2 annually. It bears directly upon public health as the agent disseminating bubonic plague and typhus fever and probably is a factor in transmitting trichina to hogs. The presence of a large rat population is a challenge to the health official but a problem which has not been solved, largely because the public lacks understanding, interest, and willingness to cooperate.

This report summarizes the factors

involved in rat control, discusses the elimination of harborage by proper ratproofing of buildings and other structures, and reviews suppression by other measures. In an excellent series of plates, the structural details of ratproofing are illustrated, together with composite drawings showing how fundamental ratproofing can be accomplished by proper design. A proposed model ordinance requiring the ratproofing of buildings is included as an appendix.

Everyone interested in the rat problem and particularly health and building officials will find this publication a valuable source of information.

J. L. BARRON

Principles and Practice of Bacteriology—By *Arthur H. Bryan, M.A., V.M.D., and Charles Bryan, M.D.* New York: Barnes & Noble, 1938. 267 pp. Price, \$2.25.

The preface and the jacket of this publication leave no doubt as to what the authors think of it. It is a "concise, concrete, and practical reference guide and text for students," including both beginners and practising bacteriologists, and from the wide range of subjects considered these students include medical, dental, dairy, industrial, and agricultural workers. They claim a unique plan of organization which should be of "inestimable value" to users of the book.

The text is very inclusive, covering all fields of bacteriology—all in less than 220 pages of text. "The tables include the pathogenic hyphomycetes and yeasts, primary determinative culture media, plant diseases, soil microbiology, dairy bacteria, veterinary pathogens, human pathogens, dental bacteria, colon typhoid differentiation, and tables of toxins and antitoxins."

The organization of the book strikes us as being good, even if too inclusive. A glossary covers 14 pages. National and State Board Questions in medicine,

veterinary medicine and nursing require 14 pages. It will be seen at once that the treatment of everything is condensed, making the book more of a quiz compend than a text. There are some excellent charts, tables, and pictures.

Conceding the desirability of a book of this type, accuracy is of the first importance. Unfortunately this text contains many errors, many ambiguous statements, many misspellings, and wrong use of words. The English is of the "catch as catch can" type. The first chapter is called History of Bacteriology. We are told that Edwin Klebs "about 1893 isolated the bacteria causing diphtheria" and that Loeffler worked with him in doing this in 1883. At the Wiesbaden Congress (1883) Klebs did not even mention attempts at cultivation or experiments on animals. Klebs saw the diphtheria bacillus but also cocci and believed that there were two types of diphtheria, one due to the cocci and one bacillary. Loeffler, an assistant of Koch—not Klebs—isolated the germ in pure culture (1884) and proved its relationship to the disease. Ehrlich is said to have formulated the humoral theory of immunity. This was due to Buchner. Ehrlich formulated the side-chain theory of immunity. Kitasato is credited with having devised a serum treatment for cholera for which we can find no authority. Sir Ronald Ross is called Hugh, and is credited with having "worked out the plasmodium malariae" whatever this may mean. Noguchi is credited with having discovered the virus of yellow fever, a claim never credited and disproved long ago.

The mistakes in the book are too numerous to mention in detail. A few examples only can be given. On page 126 we find Dorset's egg medium called "media" and two lines below Petroff's medium is properly called. In the same paragraph we find the terms "tuberculous" and "tubercular" both

used to indicate changes due to the tubercle bacillus, though the expression "tubercular milk" for milk from tuberculous cows is entirely incorrect. As forms of tuberculosis, we find "phythis," consumption; "acute miliary (sic) T. B., and scrofula tuberculosis." T. B. means tubercle bacillus, but it is repeatedly used as meaning tuberculosis. There is great confusion in the name of some stains; for example, we find Ziehl-Neelsen's, Zeihl's (sic) acid fast and Ziehl's carbol-fuchsin, all meaning one stain. The names of authors show the same carelessness. We find among books consulted, Zinsser and Bayne-Jones, but later it is reduced to "Zinsser and Jones." An author is entitled to his own name, even if it is hyphenated.

As an example of bad English we find "Antigens (means to form antibodies) are bacteria or their products which stimulate the production. . . ." Page 116, "G. Serological Diagnostic Tests," gives staining of pus, prophylaxis, etc., but no serology. The description of the "Widal or Microscopic Agglutination Tests" on page 203 is too indefinite.

The author acknowledges help and advice from many people, including the President of the Baltimore City College, the Professor of Bacteriology of the Medical School of the University of Maryland, Department of Bacteriology of the University of Alabama, and the Professor of Pathology in the Medical School of the University of Virginia. We wish they had given more advice.

The make-up and printing are good, but the proof reading is poor. We have given perhaps an unnecessary amount

of space to this book, but as it is intended for students, many of whom will probably have no opportunity of going further and obtaining correct information, it seems necessary. We see no excuse for putting a book with so many errors on the market.

MAZÿCK P. RAVENEL

Handbook of Chemistry—By Dr. N. A. Lange (2nd ed.). Sandusky, Ohio: Handbook Publisher, 1938. 1500 pp. with Appendix of 241 pp., by Dr. R. S. Burington, and Index of 30 pp. Price, \$6.00.

The second edition of this handbook has been brought up to date by revision of 31 tables and addition of 16 new tables as well as other changes.

Naturally a compiler of such a book has difficulty in deciding what data should be included without presenting an unwieldy volume but much of the tabular information desired by the scientist is to be found.

Several tables have been put up in an unusual style. These were found to be even more convenient than the ordinary type table when used. With over 170 tables of chemical, physical constants and a section of 250 pages of mathematical data its value to the scientist can only be appreciated after continued use in the laboratory. It should be a valuable addition to the library of not only the chemist, but physicist, biologist or, in fact, any scientist working in any related field who cannot take the time or who lacks the library facilities to find much of the information herein contained.

CARL S. PEDERSON

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

"See Your Dentist Twice a Year"

—In Detroit, the national health canvass was widened to include questions about visiting the dentist and the dental care received. Less than a quarter of the people canvassed had seen the dentist at any time during the year (excluding visits for extractions), the proportion varying with the economic status of the household from 42 per cent for professional to 16 per cent for unskilled workers.

BRITTEN, R. H. A Study of Dental Care in Detroit, Michigan. *Pub. Health Rep.* 53, 12:446 (Mar. 25), 1938.

Teaching Public Health to Medical Students—As practising physicians over 50 years of age received no teaching in hygiene, it is no wonder that preventive medicine is still considered a "minor." Although important strides have been made in teaching public health in recent years, there are still many more to go before the subject achieves its majority.

FITZGERALD, J. G. Undergraduate Instruction in Preventive Medicine. *J.A.M.A.* 110, 17:1322 (Apr. 23), 1938.

More Pasteurization Problems—

Units which utilize the hot pasteurized milk to pre-heat the incoming cold raw milk (thus partially cooling the pasteurized milk) should keep the hot milk under greater pressure than the cold to avoid possible contamination of the pasteurized milk through mechanical flaws. Measures for insuring this safeguard are described.

FUCHS, A. W. Contamination of Pasteurized Milk by Improper Relative Pressures in Regenerators. *Pub. Health Rep.* 53, 13:496 (Apr. 1), 1938.

How Detroit Provides School Medical Services—Describing the

plan of having school medical work done by practising physicians appointed by the county medical society for 2 year periods, it is recorded that each doctor works one morning a week under supervision. School officials and parents are pleased, and the city is well seeded with young doctors who have had some contact with public health matters.

GUDAKUNST, D. W. The Private Physician in the School. *J. Hyg. & Phys. Educ.* 9, 4:207 (Apr.), 1938.

Some Evidence of Hereditary Tendency to Cancer—

Studying mortality records in 10 Massachusetts towns it was found that among the ancestors of persons with cancer the death rate from that disease was over 1 per cent higher than the normal expectancy of cancer deaths. In another study when one parent had cancer, 10.5 per cent of the known children developed the disease, whereas only 8.6 per cent succumbed to it among those whose parents were not cancerous.

LOMBARD, H. L. Studies on the Familial Aspects of Cancer. *New Eng. J. Med.* 218, 17:711 (Apr. 28), 1938.

Better Baby Hospitalization—

Public health administrators will be interested in this committee's findings upon the hospitalization of infants. Pointing out that, despite improvement, flaws still exist in isolation procedures and that air-borne infection may be more important than we think, certain promising rules for improving hospitalization of babies are proposed.

McKIHANN, C. G., *et al.* Hospital Infections. *Am. J. Dis. Child.* 55, 3:579 (Mar.), 1938.

Ability to Pay for Health—Inadequacies in our public health services are presented in persuasive sta-

tistics. Any one who can maintain his complacency in the face of this factual exhibit deserves some sort of medal.

MOUNTIN, J. W., and O'HARA, H. Differences in Opportunities for Health. Pub. Health Rep. 53, 13:485 (Apr. 1), 1938.

The Rickettsioses—If your knowledge of the rickettsioses is hazy, you will find much in this excellent discussion of endemic typhus and Rocky Mountain spotted fevers. The wood tick, the dog tick, and the rabbit tick are all hosts and 5 other ticks may be implicated. Infection acquired by the larvae is passed on to the adult. As it is probable that spotted fever has been endemic in the east and central regions as long as in the west, it is regrettable that it was saddled with the name "Rocky Mountain."

PARKER, R. R. Rocky Mountain Spotted Fever. J.A.M.A. 110, 15:1185 (Apr. 9), 1938.

Futility of Contact Exclusion—This British Health Officer holds that, in urban areas, contacts of children suffering from communicable diseases should not be excluded automatically from school.

PAUL, H. Present Practice in Regard to Quarantine and Disinfection. Pub. Health. 51, 7:203 (Apr.), 1938.

For All to Read—This dissertation should be required reading for all sanitarians. Not only is it an excellent example of the way a scientific subject may be presented to an intelligent lay audience, but it is filled with useful data about longevity based upon many other factors than tobacco smoking about which so much newspaper publicity appeared.

PEARL, R. The Search for Longevity. Sci. Month. May, 1938, p. 462.

Good Family Survey Methods—Can reasonably accurate reports of family health practices be obtained by

house-to-house canvassers sent to gather information from a responsible member of the family? In 3 southern counties the canvass findings were checked by services utilized and the answer was: in the main, yes.

PENNEL, E. H., and O'HARA, H. The Validity of Health Service Data Gathered by the Family Survey Method. Pub. Health Rep. 53, 12:439 (Mar. 25), 1938.

What Is New in Sewage?—Review of the past year's grist of studies on the chemistry and biology of sewage treatment, sludge digestion, industrial wastes, the various uses of chlorine, and in the field of stream pollution. Of the 65 million United States population served with sewers, the sewage of 25 million is treated to some degree, whereas the remainder is discharged completely untreated into streams, lakes, and the ocean. The sewage load accumulates faster than it is being properly cared for.

PHIELPS, E. B., *et al.* Research in Sewage Chemistry, Sewage Treatment, and Stream Pollution. Sewage Works J. 10, 2:173 (Mar.), 1938.

About Pellagra—Something of the history and research on this interesting dietary deficiency disease, together with modern methods of prevention and treatment. Nursing care, which is still of utmost importance despite all the therapeutic advances, is excellently outlined in a companion article by Miss Van Blarcom.

SEBRELL, W. H. Endemic Pellagra. Am. J. Nurs. 38, 5:507 (May), 1938.

More about Polio Prevention—When zinc sulphate is used as a prophylactic against poliomyelitis, the way to apply it is to instill it into the nostrils while the head is completely inverted: 0.25 c.c. to 0.5 c.c. is a sufficient quantity.

SHAMINIAN, L., *et al.* Chemo-prophylaxis in Poliomyelitis. J.A.M.A. 110, 16:1254 (Apr. 10), 1938.

Visual Health Education—We had an epidemic of health movie dramas about a dozen years ago, but the disease burned itself out to give us a few years of comparative immunity when the health movie fever reached a state of endemicity. We are about to experience a new pandemic of talkies about hygiene, if this movie epidemiologist reads the signs aright.

WEISS, M. Box Office Attraction of Health Movies. Health Officer. 2, 10:504 (Feb.), 1938.

For Complete Community Nursing—After considering the whole field of nursing, public health, institutional, and private duty, the author concludes that a fully coördinated system of nursing in home, industry, and hospital, for rich and poor, including instruction and bedside care, is one of today's vital social problems. It is yet unsolved.

WINSLOW, C.-E. A. Nursing and the Community. Pub. Health Nurs. 30, 4:230 (Apr.), 1938.

BOOKS RECEIVED

IN THE NAME OF COMMON SENSE. By Matthew N. Chappell. New York: Macmillan, 1938. 192 pp. Price, \$1.75.

CHILD GUIDANCE PROCEDURES. Institute for Juvenile Research, Paul B. Schroeder, M.D., Director. New York: Appleton-Century, 1937. 362 pp. Price, \$2.50.

THE TREATMENT OF CLINICAL AND LABORATORY DATA. An Introduction to Statistical Ideas and Methods for Medical and Dental Workers. By Donald Mainland. Edinburgh, Scotland: Oliver & Boyd, 1938. 340 pp. Price, \$4.50.

THE ADOLESCENT. By Ada Hart Arlitt. New York: McGraw-Hill, 1938. 242 pp. Price, \$2.00.

PLAY AND MENTAL HEALTH. Principles and Practice for Teachers. By John Eisele Davis. New York: Barnes, 1938. 202 pp. Price, \$2.50.

THE HOSPITAL HEAD NURSE. Her Functions and Her Preparation. By Mary Marvin Wayland. New York: Macmillan, 1938. 388 pp. Price, \$3.50.

SOCIAL AGENCY BOARDS AND HOW TO MAKE THEM EFFECTIVE. By Clarence King. New York: Harper, 1938. 102 pp. Price, \$1.25.

EAT AND KEEP FIT. By Jacob Buckstein. New York: Emerson, 1938. 128 pp. Price, \$1.00.

WILLIAM ALANSON WHITE, M.D. The Autobiography of a Purpose. Garden City: Doubleday, 1938. 293 pp. Price, \$3.00.

FOOD VALUES OF PORTIONS COMMONLY SERVED. Compiled by Anna DePlanter Bowes and Charles F. Church. Philadelphia: Dolbey, 1937. 12 pp. Price, \$.50.

THE BACTERIOLOGICAL EXAMINATION OF WATER SUPPLIES. (Report on Public Health and Medical Subjects No. 71.) London: His Majesty's Stationery Office, 1937. 38 pp. Price, \$.50.

HEATING, VENTILATING, AIR CONDITIONING GUIDE, 1938. Published by the American Society of Heating and Ventilating Engineers, New York, 1938. 1188 pp. Price, \$5.00.

PORTABLE UNIVERSAL pH INDICATOR FOR LABORATORY AND PLANT CATALOG. Published by Leeds & Northrup Co., Philadelphia, Pa.

DIET AND HIGH BLOOD PRESSURE. By Dr. I. Harris. Toronto: Longmans Green & Co., 1937. 196 pp. Price, \$3.50.

INTERNSHIPS AND RESIDENCIES. Report of the New York Committee on the Study of Hospital Internships and Residencies. New York: Commonwealth, 1938. 492 pp. Price, \$2.50.

JURISPRUDENCE FOR NURSES. By Carl Scheffel and Eleanor McGarvah. 2d ed. New York: Lakeside Pub. Co., 1938. 248 pp. Price, \$3.00.

PRACTICAL PHYSIOLOGICAL CHEMISTRY. By Philip B. Hawk, Olaf Bergeim. 11th ed. Philadelphia: Blakiston, 1937. 968 pp. Price, \$8.00.

PASTEUR: KNIGHT OF THE LABORATORY. By Francis E. Benz. New York: Dodd, Mead, 1938. 232 pp. Price, \$2.00.

PUBLIC WORKS ENGINEERS' YEARBOOK, 1938. Chicago: American Public Works Association, 1938. 459 pp.

ASSOCIATION NEWS

HEALTH CONSERVATION CONTESTS

The Grading Committee charged with the responsibility of selecting the winning and meritorious achievement cities and counties in the 1937 Health Conservation Contests met on April 19.

In the City Contest, the following cities were announced as winners:

In Group I (cities of over 500,000 population) Boston, Mass., wins the first award. Additional awards in this population group go to Cleveland, Ohio, and Pittsburgh, Pa.

In Group II (cities of 250,000 to 500,000 population) Louisville, Ky., and Providence, R. I., receive first awards, and an additional award goes to Dallas, Tex.

In Group III (cities of 100,000 to 250,000) the winner is Hartford, Conn. Awards also go to Grand Rapids, Mich., Yonkers, N. Y., Reading, Pa., Erie, Pa., Honolulu, Hawaii, Lynn, Mass., Tacoma, Wash., and Knoxville, Tenn.

In Group IV (cities of 50,000 to 100,000 population) Sacramento, Calif., gets the first award and other awards go to Evanston, Ill., Newton, Mass., Greensboro, N. C., and Saginaw, Mich.

In Group V (cities of from 20,000 to 50,000 population) Greenwich, Conn., is the winner; and Plainfield, N. J., Auburn, N. Y., Winona, Minn., Elmira, N. Y., Watertown, N. Y., Pittsfield, Mass., Maplewood, N. J., and Orange, N. J., are given awards of merit.

In Group VI (cities of less than 20,000 population) Englewood, N. J., is the winner, and awards go to Hibbing, Minn., Virginia, Minn., and Middletown, N. Y.

In addition to these prizes, Special Awards were given to: Baltimore, Md., Brookline, Mass., Detroit, Mich., Hackensack, N. J., Newark, N. J., New Haven, Conn., Pasadena, Calif., Schenectady, N. Y., and Syracuse, N. Y.

Special prizes were awarded to the cities having the most effective community-wide programs for syphilis control and tuberculosis control. In the Syphilis Control Contest, the first award is given to

Tacoma, Wash., with awards of merit going to Hartford, Conn., Newark, N. J., Louisville, Ky., and New Haven, Conn. In the Tuberculosis Control Contest, the winner is Detroit, Mich., with awards of merit going to Newton, Mass., Hartford, Conn., and New Haven, Conn.

The following counties or district health units were declared winners in the Rural Health Conservation Contest:

In the Northeastern Division, the winner is Columbia County, N. Y., and awards of merit go to Barnstable County, Mass., Saginaw County, Mich., Southern Berkshire District, Mass., Cortland County, N. Y., Mecosta-Osceola Health Unit, Mich., Richland County, Ohio, and Ottawa County, Mich.

In the Eastern Division, the winner is Fayette County, Ky., and awards of merit go to Wicomico County, Md., Washington County, Md., Jefferson County, Ky., Scott County, Ky., Mason County, Ky., Montgomery County, Md., Arlington County, Va., and Kent County, Del.

In the Southeastern Division, the winner is Pike County, Miss., and awards of merit go to Coahoma County, Miss., Lauderdale County, Miss., Pickens County, Ala., and Berkeley County, S. C.

In the North Central Division, the winner is Woodbury County, Iowa, and awards of merit go to Charles Mix County, S. D., Lewis and Clark County, Mont., Union County, S. D., and St. Louis County, Minn.

In the South Central Division, the winner is Amarillo-Potter County, Tex., and awards of merit go to Dallas County, Tex., and Shreveport-Caddo Parish, La.

In the Western Division, the winner is Clallam County, Wash., and awards of merit go to Spokane County, Wash., Yakima County, Wash., and Bannock County, Ida.

Special Awards were given to: Davidson County, Tenn., El Paso County, Tex., and Shawnee County, Kans.

In 1937 for the first time, a Health Con-

servation Contest was conducted in Canada. St. John's-Iberville-Laprairie-Napierville Counties Health Unit, Quebec was declared the winner and other awards were given to: St. Maurice County Health Unit, Quebec, Terrebonne County Health Unit, Quebec, St. James-St. Vital Health District, Manitoba, Kamouraska-L'Islet Health Unit, Quebec, Nicolet County Health Unit, Quebec, and Chateauguay Huntingdon Health Unit, Quebec.

The United States City and Rural Health Conservation Contests awards were presented at the Annual Meeting of the Chamber of Commerce of the United States in Washington, D. C., on May 2. The Canadian Rural Health Conservation Contest awards will be presented during the meeting of the

Canadian Public Health Association in Halifax, Nova Scotia, Canada—June 20 to 22.

The awards for the Syphilis and Tuberculosis Control Contests will be presented to the health officers during the meeting of the American Public Health Association in Kansas City, October 25 to 28.

These contests are conducted annually by the Chamber of Commerce of the United States with the coöperation of the American Public Health Association. The Rural Health Conservation Contest is financed by the W. K. Kellogg Foundation and the City Health Conservation Contest by a group of insurance companies.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

J. Byron Baird, M.D., Health Department, Kingsville, Tex., Director, State Dept. of Health District 5

Charles J. W. Beckwith, M.D., D.P.H., P. O. Box 322, Sydney, N. S., Canada, Divisional Medical Health Officer, Dept. of Public Health

Emmanuel W. Billard, M.D., 33 E. 208 St., New York, N. Y., Physician in charge, Tuberculosis Clinic, Dept. of Health

Marvin A. Childers, Jr., M.D., 820 Alamo National Bank Bldg., San Antonio, Tex., Assistant City Health Officer

James H. Hill, M.D., Box 262, Talladega, Ala., County Health Officer

William B. Hunter, M.D., Lillington, N. C., Harnett County Health Officer

Lynn J. Lull, M.D., Municipal Bldg., La Junta, Colo., Otero County Health Officer

Charles F. Mares, M.D., 605 American National Bank Bldg., Galveston, Tex., County Health Officer

Robert M. Marr, M.D., 92 Elm, Westfield, Mass., Chairman, Board of Health

Harmon U. Sanders, M.D., Federal Bldg., Muskogee, Okla., Senior Physician, Five Tribes Agency

Walter L. Sheppard, M.D., McRae, Ga., Health Commissioner, Telford-Wheeler Counties

Marcus T. Smith, M.D., 541 Davis St., Conway, Ark., Medical Director, District 4

Murray Smith, M.D., Tuskegee, Ala., Macon County Health Officer

John E. Stoddard, M.D., City Hall, Meriden, Conn., Health Officer

Vernon A. Turner, M.D., Richlands, Va., Buchanan, Russell, Tazewell County Health Officer

Harold C. Whims, M.D., Rutherfordton, N. C., Rutherford County Health Unit

Laboratory Section

Elizabeth M. Baethke, 2338 McDowell St., Augusta, Ga., Laboratory Assistant, University of Georgia Medical School

Melba Black, 915 N. Center, Stockton, Calif., Bacteriologist, San Joaquin Local Health District

Rita L. Canessa, Rt. 4, Box 760, Stockton, Calif., Bacteriologist, San Joaquin Local Health District

Leigh H. Churchill, 2114 N. E. Wasco St., Portland, Ore., City Bacteriologist

Hal W. Cutshall, 1630 S. 14 East, Salt Lake City, Utah, Technician, State Board of Health

Michael A. Farrell, Ph.D., 420 Adams Ave., State College, Pa., Associate Professor of Bacteriology, Pennsylvania State College

Fay G. Gardner, 1325 S. 2nd East, Salt Lake

City, Utah, Stenographer, State Board of Health

Sidney E. Gilchrist, 105 S. State St., Salt Lake City, Utah, Chief, Division of Bacteriology, City Health Dept.

Dudley P. Glick, Ph.D., Colorado State College, Fort Collins, Colo., Assistant Professor of Bacteriology

John W. Hornibrook, M.D., National Institute of Health, Washington, D. C., P. A. Surgeon, U. S. Public Health Service

Margaret Ingersoll, 919 First Ave., Salt Lake City, Utah, Laboratory Technician, U.S.V.A.

Wilfrid C. Kennell, 6255 N. E. Willow, Portland, Ore., City Chemist

Thomas L. Martin, Ph.D., 20 E. 9th North, Provo, Utah, City Bacteriologist

Michael G. O'Connor, 47 Mooreland, Springfield, Mass., Chemist, Health Dept.

Edward V. O'Gara, 14th Ave. & Lake St., San Francisco, Calif., Medical Technician, U. S. Public Health Service Laboratory

J. Albert Paradis, Jr., P. O. Box 1809, Juneau, Alaska, Technician, Territorial Dept. of Health Laboratory

Roy E. Rudolph, Jr., 1476 E. 13 South, Salt Lake City, Utah, Bacteriologist, State Board of Health

Ralph B. Williams, 1498 W. 8th South, Salt Lake City, Utah, Bacteriologist, State Board of Health

Winfield F. Wood, 136 State Capitol, Salt Lake City, Utah, Serologist, State Board of Health

Vital Statistics Section

Theodore A. Janssen, 2305 Mt. View Pl., S. E., Washington, D. C., Chief of Nosology Section, Division of Vital Statistics, Bureau of the Census

Public Health Engineering Section

Clifford T. Ayres, Dept. of Public Health, Fort Worth, Tex., City Sanitary Engineer

Carle D. Brown, 388 N. Main, Salt Lake City, Utah, Sanitarian, State Board of Health

Harry L. DeLozier, 311 City Hall, Louisville, Ky., Chief, Division of Milk Control, Health Dept.

William R. Hardy, Box 82, Mineral Wells, Tex., District 2 Sanitary Engineer, State Dept. of Health

Glen J. Hopkins, 211 W. McCarty, Jefferson City, Mo., State Board of Health

Howard M. Hurst, State Capitol, Salt Lake City, Utah, Assistant Sanitary Engineer, State Board of Health

Robert D. Karstaedt, 110 W. School St., Visalia, Calif., Inspector, State Dept. of Public Health

George S. Moore, P. O. Box 125, Albemarle, N. C., Supt., Water & Light Dept.

George W. Newman, Route 1, Yuma, Ariz., Sanitarian, Yuma County Public Health Service

Newell W. Pickett, 2018 S. 6th East, Salt Lake City, Utah, Sanitary Inspector, State Board of Health

Elmer B. Quist, Public Health District 2, Cedar City, Utah, Sanitarian, District 2, State Board of Health

Robert Y. Rhyne, County Health Dept., Wadesboro, N. C., Sanitarian, Anson County Health Dept.

Ellis R. Shields, 266 N. 2nd East, Price, Utah, District Sanitarian, State Board of Health

E. I. Stewart, Jr., 327 E. 1st South St., Salt Lake City, Utah, Sanitarian, State Board of Health

Augustus F. Sweetland, P. O. Box 335, Fort Valley, Ga., District Supervisor, State Dept. of Public Health

Ward Warnock, 207-24 St., Ogden, Utah, Sanitarian, Health District 1, State Board of Health

Food and Nutrition Section

Walter R. Lowry, 903-2nd Ave., Salt Lake City, Utah, Sanitarian, City Board of Health

Charlotte Raymond, 12 Austin St., Newtonville, Mass., Community Nutritionist, City Health Dept., etc.

Alexander A. Singer, 225 E. 79 St., New York, N. Y., Senior Chemist, Dept. of Health

Rafael G. Venegas, D.V.M., Ministerio de Sanidad, Caracas, Venezuela, S. A., Jefe de Abasto de Leche

Oscar Zurer, 993 President St., Brooklyn, N. Y., Health Inspector, Department of Health

Child Hygiene Section

Orren Lloyd-Jones, M.D., Ph.D., 1930 Wilshire Blvd., Los Angeles, Calif., Lecturer in Public Health, University of California at Los Angeles

Chlima Taback, M.D., 1463 Ocean Ave., Brooklyn, N. Y., School Physician, East New York Vocational High School

Marie Wickert, 123 E. 16 Ave., Denver, Colo., Assistant Director, Division of Crippled Children, State Board of Health

Philip W. Woods, D.D.S., Bureau of Health, Augusta, Me., Director, Division of Dental Hygiene

Public Health Education Section

Edgar A. Farrow, M.D., Box 1610, Cedar City, Utah, Supt. and Physician of Pointe Indian Agency, U. S. Indian Service

Bruno Gebhard, M.D., 128 Webster Ave., Manhasset, L. I., N. Y., Exhibit Consultant, Committee on American Museum of Hygiene, A.P.H.A.

Norman F. Gerrie, D.D.S., Rm. 130, State Capitol, Salt Lake City, Utah, Charge of Mobile Dental Unit, State Board of Health

Lyman D. Heacock, D.D.S., 306 State Bldg., San Francisco, Calif., Chief of Dental Service, Bureau of Child Hygiene, State Dept. of Public Health

Bertha K. LaFleur, 3012 Sunnyslope, Miami, Ariz., School Nurse, Globe Public Schools

Elden L. Stewart, 11104 N. E. Wygant St., Portland, Ore., Sanitary and Milk Inspector, Wasco County Health Unit

Florence E. Strause, 309 W. 109 St., New York, N. Y., Supervisor, Highbridge office, Henry St. Visiting Nurse Service

Public Health Nursing Section

Bride L. Cawthon, City Health Dept., Memphis, Tenn., Director, Division of Public Health Nursing

Margaret P. Dietz, Vernal, Utah, Public Health Nurse, State Board of Health

Mary H. Emberton, R.N., 1063 Monroe St., Denver, Colo., Advisory Nurse, Maternal and Child Health, State Dept. of Health

Laura C. Harstad, 816 Oregon Bldg., Portland, Ore., Maternal-Child Health Consultant, State Board of Health

Louella Mahoney, R.N., Salt Lake General Hospital, Salt Lake City, Utah

Marcella M. McInerny, 336 E. S. Temple, Salt Lake City, Utah, State Director of Crippled Children's Service, State Board of Health

Mary McQuillen, R.N., 130 State Capitol Bldg., Salt Lake City, Utah, Supervisor, Staff Education, State Board of Health

Mary C. Robinson, R.N., 961-3rd St., Yuma, Ariz., Supervising Nurse, Yuma County Public Health Service

Belle J. Rosenstock, 141 Hawks Court, Salt Lake City, Utah, Field Nurse, Utah Tuberculosis Assn.

Margrete Skaarup, State Health Dept., Bisnark, N. D., Supervisor, Public Health Nursing, State Health Dept.

Joy B. Stuart, Ambassador Hotel, Salt Lake City, Utah, Maternal and Child Health Advisory Nurse, State Board of Health

Frances A. Sweeney, R.N., State Teachers College, Flagstaff, Ariz., School Nurse

Bessie Williams, Box 96, Hood River, Ore., County Nurse

Margaret A. S. Willmon, Box 1505, Yuma, Ariz., Nurse, Yuma County Health Service

Epidemiology Section

Louventure Alcindor, M.D., Avenue Cameau, Port-au-Prince, Haiti, Public Health Officer, Port-au-Prince Haitian General Hospital

Leopoldo Briceno-Iragorry, Clinica Luis Razetti, Caracas, Venezuela, S. A., Medico Epidemiologo, Ministerio de Sanidad

Lincoln de Freitas, Filho, C.P.H., National Health Dept., Rio de Janeiro, Brazil, S. A., Health Officer

Paul A. Keeney, M.D., University Club, Harrisburg, Pa., Acting Director, Child Health and Maternal Welfare, and Epidemiologist, State Dept. of Health

Irving Rappaport, 864 Cauldwell Ave., New York, N. Y., Research Assistant in Parasitology, Cornell University Medical College, Dept. of Public Health (volunteer)

Unaffiliated

Eloise B. Cram, Ph.D., National Institute of Health, Washington, D. C., Senior Zoologist

Victor H. Haas, M.D., U. S. Public Health Service Laboratory, San Francisco, Calif., Commissioned Officer

John M. Hayek, M.D., 2319-46 St., Des Moines, Ia., Acting Director, Division of Child Health and Health Education, State Dept. of Health

Joseph R. Horn, D.D.S., 617 W. 168 St., New York, N. Y., Educational work with Oral Hygiene Committee of Greater New York

Catherine F. Ronan, D.M.D., 145 Federal St., Salem, Mass., Dental Supervisor, State Dept. of Public Health

Clement Scott, M.D., 6526 Scotten, Detroit, Mich., Student

John Williams, 10916-100 Ave., Edmonton, Alta., Canada, Health Inspector, Local Board of Health

CLOSING DATE FOR SUBMITTING APPLICATIONS FOR FELLOWSHIP

SEPTEMBER 1 is the latest date the Committee on Eligibility can accept Fellowship applications. This date is set in order that there may be sufficient time to route them through the preliminary steps necessary before they

receive final consideration at the hands of the Governing Council during the Kansas City Annual Meeting. Eligible members who wish to apply for Fellowship are therefore urged to submit their applications in the near future.

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS WANTED

HEALTH OFFICERS

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins, and 14 years' public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, M.D., Yale; M.S.P.H., Columbia; good clinical background; will consider appointment in child health, epidemiology or public health administration. A350

Physician, aged 38, with excellent training in medicine, pediatrics and epidemiology, is completing work for Dr.P.H., and will consider appointment in administration, preferably in county health work. A366

Physician, M.D., Class A medical school; M.P.H., Harvard School of Public Health; extensive experience in pediatrics and school medical service; also background of county health administration and teaching in medical school, will consider expanded opportunity in teaching or research. A302

Physician, experienced in health administration of cities and states, will consider attractive opening in maternal and child health or health education. A343

Physician, M.D., Class A school; M.S.P.H., University of Michigan, 1937; now serving as district state health officer, seeks full-time administrative position in city or county. A367

Physician, M.D., McGill; C.P.H., Johns Hopkins; excellent background of communicable disease control and school health service, seeks administrative public health position or as epidemiologist. A368

Physician, M.D., University of Cincinnati; with postgraduate training in venereal disease control, Johns Hopkins; now employed, is available for venereal disease control officer. A363

Physician, M.D., Tufts; C.P.H., Johns Hopkins; administrative experience large city health department, will consider position as health officer or epidemiologist. A362

HEALTH EDUCATION

Woman, M.D., Boston University; special work in Columbia and Massachusetts Insti-

tute of Technology; one year's experience in State Hospital; interested in psychiatry, desires position in the east in hospital for mental diseases, or industrial school. H248

Young woman, M.A. in Health Education, Teachers College, Columbia University; with splendid international experience, seeks position as director of health education with preference for New York City. H369

Woman, with excellent preparation and wide experience in health education field; organization, administration, supervision and program making in city, rural and state work. Now employed but would consider good opportunity. \$3,500 minimum. H316

LABORATORY

Experienced bacteriologist with teaching in research background, seeks position as director of laboratory. L370

Bacteriologist and pathologist with wide administrative experience; Ph.D., Brown University, will consider leading position in his field. L371

SANITARY ENGINEERING

Graduate Sanitary Engineer with service under U. S. Public Health Service and state departments of health, especially interested in filtration plant design and operation and shellfish sanitation, seeks employment. E356

Experienced sanitary engineer, graduate of M.I.T., seeks responsible position. E372

CHILD HYGIENE

Experienced physician, M.D. and Ph.D., University of Minnesota; specially qualified in maternal and child hygiene, directing state and local programs; will consider position of better sort. A238

MISCELLANEOUS

Young man, Sc.D., Johns Hopkins; experience in public health and research bacteriology; will consider position in public health work or university teaching. L312

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. M352

NEWS FROM THE FIELD

VENEREAL DISEASE CONTROL BILL PASSES CONGRESS

THE United States Senate, on May 17, passed and sent to the White House the LaFollette-Bullwinkle Bill, providing for a study of venereal disease control measures and the expansion of a program. The measure authorizes appropriations to finance activity by the Public Health Service and coöperation with states to the amount of \$3,000,000 for the fiscal year beginning July 1, 1938, \$5,000,000 the next year and \$7,000,000 the third year, "and thereafter such sums annually as Congress may determine for the purposes of the Act."

The Bill in its final form passed both the House and the Senate by unanimous vote and was sent to the White House with the expectation that it would be signed by the President. The sponsors of the Bill point out that this is not an appropriation and that it will now be necessary to present estimates to the budget director, and ask the appropriating committees of the House and Senate for the inclusion of this item in the Deficiency Appropriation Bill in order to make funds actually available.

STUDY OF MUNICIPAL ABATTOIRS

A STUDY of the cost and operation of 32 city owned abattoirs and the methods employed for the control of private slaughterhouses has been published jointly by the American Municipal Association and the International City Managers' Association, 1313 East 60 Street, Chicago, Ill.

Of the 25 municipal abattoirs in the United States municipally owned and operated for which figures are

presented, 11 are operated by health departments. Construction costs of these plants run from a few thousand dollars to over \$100,000 and the annual operating costs from \$2,800 to \$33,000 some of which is offset by revenues from fees.

WESTERN BRANCH COMMITTEE ON MILK CONTROL

IN order to take advantage of the presence of Robert S. Breed, Ph.D. (Chairman of the Standard Methods Committee on Examination of Dairy and Food Products, Laboratory Section, A.P.H.A.), P. W. Covington, M.D., President of the Western Branch A.P.H.A., has appointed a Committee on Milk Control which will function at the Western Branch annual meeting in Portland, Ore., June 6-8. The personnel of the committee is as follows:

Chairman: Professor Courtland S. Mudge—College of Agriculture, University of California, Davis, Calif.

William Levin, Dr.P.H.—Director of Laboratories, State Department of Health, Portland, Ore.

Austin U. Simpson, M.D.—Director of Laboratories, State Department of Health, Seattle, Wash.

Charles W. Duckworth, D.V.M.—Bureau of Animal Husbandry, Sacramento, Calif.

E. H. Bramhall—Director of Laboratories, State Department of Health, Salt Lake City, Utah.

Dr. Raymond VanBuren Stone—Director of Laboratories, Los Angeles County Department of Health, Los Angeles, Calif.

Lewis H. Howard, M.D.—Health Officer of Pima County, Tucson, Ariz.

OBSTETRICS AND PEDIATRICS COURSES

THE Minnesota State Medical Association, in coöperation with the University of Minnesota Medical School and State Department of Health, began

the second state-wide graduate course in obstetrics and pediatrics in Crookston and Winona, Minn., May 7. The lectures were also given in Hibbing, Willman, Albert Lea, Fergus Falls, Worthington, and Bemidji, Minn.

The Illinois State Department of Health, in coöperation with the educational committee of the State Medical Society, will begin a series of weekly courses on obstetrics and pediatrics on July 5. These will be held at the Research and Educational Hospital, University of Illinois College of Medicine, and will continue through July and August.

SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION MEETING

THE South Carolina Public Health Association held its annual meeting at Myrtle Beach, May 23. New officers of the Association are as follows:

President—W. K. Fishburne, M.D., of Moncks Corner

Vice-President—William B. Furman, M.D., of Pickens

Secretary and Treasurer—Mrs. Frank George, R.N., of Columbia

Representative to the A.P.H.A.—James A. Hayne, M.D., of Columbia

Speakers from outside the state included: Arthur T. McCormack, M.D., President, A.P.H.A.; John A. Ferrell, M.D., Chairman of the Executive Board, A.P.H.A.; Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.; and Harry J. Mustard, M.D., Biggs Professor of Preventive Medicine, New York University.

PHYSICAL EDUCATION ASSOCIATIONS MERGE

THE forty-third annual convention of the American Association for Health and Physical Education was held in Atlanta, Ga., April 20-23.

The American Association for Health and Physical Education became a de-

partment of the National Education Association in 1936 after a merger of the American Physical Education Association and the Department of School Health and Physical Education of the National Education Association. The new department will be represented by an executive secretary at N.E.A. headquarters, Washington, D. C., after September, 1938, when the association's offices will be moved to that city. The new department will continue the publication of its magazine, *The Journal of Health and Physical Education*.

At the Atlanta convention the association revised its name and will now be known as the American Association for Health, Physical Education and Recreation.

The following officers were elected:

President—Dr. N. P. Neilson, Stanford University, Calif.

President-elect—Margaret Bell, M.D., University of Michigan; Ann Arbor, Mich.

Vice-Presidents—Health Section, Dorothy B. Nyswander, Ph.D., New York, N. Y.; Physical Education, Grover W. Mueller, of Philadelphia, Pa.; Recreation, Frank S. Lloyd, of New York, N. Y.

The association will meet in San Francisco, Calif., in 1939.

NURSING DIRECTOR HONORED

GRACE Ross, R.N., Director of Nursing of the Detroit Department of Health, was elected President of the National Organization for Public Health Nursing at the biennial meeting of that association which was held in Kansas City April 24-29.

Miss Ross came to the department in 1914 and was made Director of Nursing in November, 1915. At that time the nursing personnel numbered 68, and through her efforts qualifications and standards for nursing in the department have been raised to the highest in the country. The nursing staff membership today is 424. It was

stated that the evolution of public health nursing, from a few small techniques of specialized service to a generalized service which covers 70 per cent of the city, may be credited to Miss Ross's determined effort to supply the best possible education for health for the largest number of persons, at the least expense to the community.

MENDEL MEDAL AWARDED DR. PARRAN

THOMAS Parran, M.D., Surgeon General of the U. S. Public Health Service, received in May the Mendel Medal from Villanova College for outstanding work in science. Dr. Parran will be the tenth recipient of the Mendel Medal award founded by the College in 1928 in honor of Gregor Mendel, Abbot of the Augustinian Monastery, Brunn, Austria, who gave to the world the Mendelian Laws of heredity.

PERSONALS

Central States

CLARENCE D. BARRETT, M.D.,* of East Lansing, Mich., Director of the Bureau of Communicable Diseases of the Michigan State Department of Health, has been placed in charge of a newly created full time health unit in Ingham County, with offices at Lansing.

GEORGE D. BLUME, M.D., was recently appointed Health Commissioner of New Boston, Ohio.

FILIP C. FORSBECK, M.D.,* for 6 years Assistant Director of the Bureau of Communicable Diseases of the Michigan State Department of Health, has been appointed Director, succeeding **CLARENCE D. BARRETT, M.D.***

THOMAS E. GIBSON, M.D.,† of Paw Paw, Mich., has been appointed Health Director of Van Buren

County. He was Health Director of Eaton County.

JAMES N. PATTERSON, M.D., formerly Assistant Professor of Pathology, at the University of Cincinnati College of Medicine, has been appointed Director of Laboratories by the Florida State Department of Health. He will succeed the late **PAUL EATON, M.D.†**

Eastern States

RUFUS COLE, M.D., D.Sc.,† Director of the hospital of the Rockefeller Institute, New York, since 1909, received the George M. Kober Medal for distinguished service to medicine from the Association of American Physicians. Dr. Cole's work on pneumonia and the pneumococcus, as well as his efforts in the whole science of bacteriology, was praised by Dr. Frederick F. Russell, of Boston, who made the presentation. **BENJAMIN C. GRUENBERG, Ph.D.,*** of New York, is a member of the Committee on Biological Science Teaching of the Union of American Biological Societies, which has received a grant from the Carnegie Corporation of New York for the Advancement of Teaching toward support of the educational program.

JAMES J. MINOT, M.D.,† of Boston, Mass., has been elected to the newly created position of Honorary President of the Boston Tuberculosis Association.

MATTHIAS NICOLL, JR., M.D.,* of White Plains, N. Y., Commissioner of Health of the Westchester County Department of Health, retired on April 30, after serving since the organization of the Department in 1930. Dr. Nicoll was formerly State Commissioner of Health of New York. He is succeeded by **GEORGE H. RAMSEY, M.D.,*** recently Assistant Commissioner of the New York State Department of Health.

* Fellow A.P.H.A.

† Member A.P.H.A.

JOHN E. STODDARD, M.D., has been appointed Health Officer of Meriden, Conn., to succeed MICHAEL J. SULLIVAN, M.D.†

DR. WINFIELD E. WIGHT is the new Health Officer of Thomaston, Conn., succeeding DR. JAMES H. KANE, resigned.

Southern States

HAROLD W. BROWN, M.D., Sc.D., Dr.P.H.,† Professor of Preventive Medicine and Public Health at the University of North Carolina, Chapel Hill, N. C., spoke at Duke University, April 14. The subject of the lecture was "Hookworm."

ARTHUR T. McCORMACK, M.D.,* Commissioner of Health of Kentucky, was a guest speaker at the 72nd annual session of the Texas State Medical Association in Galveston, May 10-12. The subject of Dr. McCormack's talk was "Whose Responsibility Is Public Health and Medical Service?"

MEDICAL DIRECTOR GEORGE W. MCCOY,† of the U. S. Public Health Service, Washington, who for the past year has been carrying on field studies on the spread and prevalence of leprosy and the influence of control measures on the disease, will in future have headquarters for these studies and other official duties at New Orleans, La. In addition to his Public Health Service duties, Dr. McCoy is to organize and serve as head of the Department of Preventive Medicine of Louisiana State University Medical School, which Department the University is establishing this year.

WILLIAM J. MURPHY, M.D.,† of Kingsport, Tenn., Assistant Health Officer of Sullivan County, has been appointed to the staff of the Tennessee State Department of Health for work in venereal disease control.

Western States

SAIDIE ORR DUNBAR,* Executive Secretary of the Oregon State Tuberculosis Association, was elected President of the General Federation of Women's Clubs at their meeting in May, in Kansas City, Mo.

DR. MARTHA E. D. RINEHART-ALLEN is the new Health Officer of Fairfax, Calif., succeeding DR. BERNARD J. CONROY.

DR. ALPHONSO O. SKANCKY has been appointed Health Officer of San Bruno, Calif., to succeed the late DR. FRANK HOLMES SMITH.

Puerto Rico

EDUARDO GARRIDO-MORALES, M.D., Dr.P.H.,* Commissioner of Health of Puerto Rico, San Juan, P. R., has recently been acting as Governor of Puerto Rico during the absence of Governor Winship. Dr. Garrido-Morales has been reappointed as Commissioner of Health for 4 years and his appointment was unanimously confirmed by the Senate.

DEATHS

DR. WILLIAM FRANKLIN ELGIN,* associate of the late Dr. Walter Reed, died April 18. He was 76 years old. Long a prominent bacteriologist and formerly a practising physician, Dr. Elgin was a pioneer in the development of vaccines. He specialized in smallpox vaccine production and improved methods of preparation. Dr. Elgin belonged to the American Medical Association, American Public Health Association, American Bacteriological Society, and the Medical and Chirurgical Faculty of Maryland.

ROBERT W. FOWLER, M.D.,† for 42 years connected with public health work in New York, N. Y., died April 28, at the age of 64.

* Fellow A.P.H.A.

† Member A.P.H.A.

PROFESSOR DR. MAX NEISSER, Professor of Hygiene and Bacteriology at Frankfort-am-Main, Germany, died at the age of 69. He was well known for his bacteriologic work on the differential diagnosis of the diphtheria bacillus and on the staphylococcus, and made valuable contributions to knowledge of the mutation of bacilli.

FRANK L. WATKINS, M.D.,* City-County Health Officer of Great Falls, Mont., since 1930, died April 7, of pneumonia, age 58. In 1908 he was appointed to establish the Bureau of Vital Statistics in the State of Ohio, which was regarded as a model in the United States. In 1911 he received the appointment as Special Agent of the Division of Vital Statistics for the government. Prior to 1930, he was associated with the State Health Departments of Minnesota, Mississippi,

and Florida. He was Director of Health Education in the city schools of Tulsa, Okla., for 6 years. He was a member of the A.P.H.A. from 1927 and a Fellow from 1931.

BENJAMIN WHITE, PH.D.,* died April 28, in Southern Pines, N. C., at the age of 59. Dr. White was Director of the Division of Biologic Laboratories, Massachusetts Department of Health, which position he held until his retirement in 1933. Under the sponsorship of the Commonwealth Fund, of which he was a consultant, Dr. White wrote a recent volume entitled *The Biology of the Pneumococcus*. He was an active member of the Massachusetts Public Health Association.

WADE HAMPTON FROST, M.D.,* Professor of Epidemiology in the Johns Hopkins School of Hygiene and Public Health, Baltimore, Md., died on May 1. (See Editorial, page 773.)

* Fellow A.P.H.A.

CONFERENCES AND DATES

American Academy of Tuberculosis Physicians. San Francisco, Calif. June 17-18.

American Association of Industrial Physicians and Surgeons—23rd Annual Meeting; and Second Annual Midwest Conference on Occupational Diseases. Palmer House, Chicago, Ill. June 6-9.

American Association of Medical Milk Commissions. San Francisco, Calif. June 13-14.

American Association of Medical Social Workers; and American Association of Psychiatric Social Workers. Seattle, Wash. June 26-July 2.

American Association of Social Workers. Seattle, Wash. June 26-July 2.

American Dental Association. Hotel Statler, St. Louis, Mo. October 24-28.

American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9-14.

American Federation of State, County, and Municipal Employees. Atlanta, Ga. August 29.

American Heart Association. Sir Francis Drake Hotel, San Francisco, Calif. June 10-11.

American Home Economics Association—31st Annual Meeting. William Penn Hotel, Pittsburgh, Pa. June 28-July 1.

American Medical Association. Hotel Sir Francis Drake, San Francisco, Calif. June 13-17.

American Medical Women's Association—National Convention. Fairmont Hotel, San Francisco, Calif. June 12-14.

American Public Health Associa-

- tion — 67th Annual Meeting. Hotels Muehlebach, President, Kansas Citian, Kansas City, Mo. October 25-28.
- American Public Welfare Association — Joint Meeting with National Conference of Social Workers. Seattle, Wash. June 26-July 2.
- American Society of Planning Officials. Joint Conference with American Planning and Civic Association, and American City Planning Institute. Minneapolis, Minn. June 20-22.
- American Veterinary Medical Association. New York, N. Y. July 5-9.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13-15.
- Health Officers and Public Health Nurses—Annual Conference. Under the Auspices of the New York State Department of Health. Saratoga Springs, N. Y. June 22-24.
- International Association for Identification. Columbus, Ohio. August 16-20.
- Medical Library Association. Hotel Somerset, Boston, Mass. June 28-30.
- Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13-15.
- Michigan Public Health Association. Lansing, Mich. November 9-11.
- Mississippi Valley Conference on Tuberculosis—25th Annual. Twelve states represented. Hotel Statler, St. Louis, Mo. September 21-24.
- National Conference of Social Workers—Joint Meeting with American Association of Schools of Social Work, and American Association of Schools of Social Work. Seattle, Wash. June 26-July 2.
- National Education Association. Pennsylvania Hotel, New York, N. Y. June 26-30.
- National Hospital Association (Negro). Hampton, Va. August 14-16.
- National Tuberculosis Association. Biltmore Hotel, Los Angeles, Calif. June 20-23.
- New Mexico Public Health Association. Las Vegas, N. M. October 30, 31, November 1.
- New York State Association of School Physicians—Annual Meeting. Grand Union Hotel, Saratoga Springs, N. Y. June 27.
- New York State Department of Health —Annual Conference. Saratoga Springs, N. Y. June 28-30.
- New York State Sewage Works Association—Fall Meeting (joint meeting with New England Sewage Works Association). Hotel Bond, Hartford, Conn. October 6-8.
- New York State Sewage Works Association—Spring Meeting. Buffalo, N. Y. June 3-4.
- Pacific Coast Branch of State Registration Executives. Hotel Multnomah, Portland, Ore. June 6-8.
- Pennsylvania Sewage Works Association—12th Annual Conference. State College, Pa. June 8-10.
- Social Work Publicity Council. Seattle, Wash. June 26-July 2.
- Southern Branch, American Public Health Association—7th Annual Meeting; and Southern Medical Association. Oklahoma City, Okla. November 15-16, 1938.
- Texas Public Health Association. San Antonio, Tex. November 7-9.
- Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2-9, 1939.
- Western Branch, American Public Health Association. Hotel Multnomah, Portland, Ore. June 6-8.

FOREIGN

- International Union of Local Authorities. Bucharest, Roumania. June 15.
- Ontario Health Officers' Association. Chateau Laurier, Ottawa, Ont., Canada. June 17-19.
- Canadian Public Health Association.

- Lord Nelson Hotel, Halifax, N. S., Canada. June 20-22.
- International Engineering Congress. Glasgow, Scotland. June 21-24.
- Royal Sanitary Institute. Portsmouth, England. July 11-16.
- Scientific Congress of Doctors and Dentists—"ARPA." Prague, Czechoslovakia. July 21-25.
- International Medical Society for Psychotherapy—10th Annual Congress. Balliol College, Oxford, England. July 29-August 2.
- British Dental Association. Belfast, Ireland. July 29-August 3.
- International Meeting for Cell Research. Anatomical Institute, Zurich, Switzerland. August 7-13.
- International Congress on Housing and Town Planning. Mexico City, Mexico. August 13-20.
- Sixteenth International Physiological Congress. Zurich, Switzerland. August 14-18.
- British Association for the Advancement of Science. Cambridge, England. August 17-24.
- International Veterinary Congress, Thirteenth. Zurich and Interlaken, Switzerland. August 20-27.
- International Congress for the History of Medicine, Ninth. Zagreb, Yugoslavia. September 3-11.
- Pan American Sanitary Conference, Tenth. (Last Conference was held in Buenos Aires, 1934.) Bogota, Colombia. September 4-18.
- Special International Conference on Sewage Works and Disposal. Glasgow, Scotland. September 12-18.
- Third United International Congress of Tropical Medicine and Malaria. Amsterdam, The Netherlands. September 24-October 1.
- Eighth International Congress of Industrial Accidents and Occupational Diseases. Frankfurt-am-Main, Germany, September 26-30.
- Pan-American Congress of Municipalities. Havana, Cuba. November.

Best Sellers in the Book Service for May

Rural Health Practice—Harry S. Mustard, M.D.....	\$4.00
The Treatment of Clinical and Laboratory Data—Donald Mainland	4.50
Principles of Medical Statistics—A. Bradford Hill.....	2.25
Graphs: How to Make and How to Use Them—Herbert Arkin and Raymond R. Colton.....	3.00
Apes, Men and Morons—Ernest A. Hooton.....	3.00
Preventive Medicine and Hygiene (6th ed.)—Milton J. Rosenau, M.D.	10.00
The Foundations of Nutrition (3d ed.)—Mary Swartz Rose...	3.50

Order from the Book Service

The American Public Health Association
50 West 50th Street
New York, N. Y.

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

July, 1938

Number 7

Investigation of Early Syphilis*

WILLIAM T. CLARK, M.D., AND
CLEALAND A. SARGENT, M.D.

*Associate Professor of Preventive Medicine, University of Buffalo; and
Director, Buffalo Syphilis Control Service, State Department
of Health, Buffalo, N. Y.*

IN May, 1935, the Departments of Health of the City of Buffalo and the State of New York entered into a coöperative arrangement for the development of more effective local measures for the control of syphilis. The program decided upon included as an essential item a field investigation of all early cases coming to the knowledge of the City Health Department through the usual channels of physicians' reports and clinic admissions. The purposes of the investigation were: (1) by tracing backward in time, to discover and bring under treatment the persons from whom infection might have been received; and (2) by forward extension to discover those people who had been infected or exposed to risk by the original patients.

The investigation was concerned chiefly with individuals with whom the patients had been in sexual contact, either prior or subsequent to their own dates of infection; but also included

efforts to reach closely associated non-sexual contacts. When the investigation led to discovery of infected persons, it was extended to include the antecedent and subsequent sexual contacts of such individuals. The chain of infection was followed, both backward and forward as far as possible, but extension beyond the patient's direct contacts was seldom practicable.

This study deals with cases investigated between June 1, 1935, and June 30, 1937. Only cases are included which at the time of admission to clinics, or of report by the attending physician, were satisfactorily identified as early syphilis in the primary, secondary, or early latent stage. All cases were among persons giving histories which placed their dates of infection within the preceding year and who had not been previously reported to the City Department of Health. The 488 cases falling into the above category were designated as "initial" cases. They included 464 cases of genital syphilis and 24 cases of extragenital syphilis. Of the 464 genital cases, 48 per cent were primary, 39 per cent secondary, and 13 per cent early latent.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

ANTECEDENT CONTACTS

Success in tracing syphilitic infection to its specific source depends on conditions peculiar to venereal diseases. In non-venereal diseases, it may usually be taken for granted that the patient is willing to give information, but he is rarely able to identify a specific source because he himself usually has no way of knowing the exact time and place where the infection was contracted. Again, the patient is by no means the sole, nor even necessarily the most important source of information. Equally pertinent facts may be available from many other informants. In contrast to most other diseases, the circumstances under which genital syphilis is acquired, except among prostitutes and very promiscuous males, can usually be stated quite exactly by the infected person. He is in a position to know with a considerable degree of certainty when infection was contracted and to what particular individual he was exposed. Such information is available from no other source than the patient himself so that the first essential to success in investigation is willingness on the part of the patient to give fully all facts that will aid in identifying the source of infection. Without this coöperation little or no progress can be made.

Since the first and most important factor in successful investigation is the patient's unreserved coöperation, it is desirable to classify patients primarily according to their willingness to give essential information, which is more difficult than at first appears.

It is easy enough to classify those who deny exposure or flatly decline to give information about it, and it is equally simple to designate as coöperative those whose information leads directly to the discovery and identification of infectious syphilitics who verify the account given by the patient, but many histories elicited in a large city are of a different kind. The patient,

with apparent frankness, may give names of persons who cannot be located at the address given or who on investigation are found to be non-syphilitic; or he may profess not to know the names and addresses of the persons with whom contact is admitted. In such cases, it can only be a matter of surmise whether the patient is sincerely coöperating or is purposely giving misleading information.

Among the 464 cases of early acquired genital syphilis there were 33 patients—for the most part, seen only once in the clinic—who were lost from observation before any helpful information had been elicited. The remaining 431 are classified in Table I with respect to their apparent willingness to give information which would lead back to their specific sources of infection.

TABLE I
Success Achieved in Obtaining Information Which Might Lead to the Identification and Examination of Specific Sources of Initial Syphilis Cases—Buffalo, N. Y., 1935-1937

<i>Classification</i>	<i>Number of Initial Cases</i>	<i>Per cent of Investigated Cases</i>
Declined to give information	44	10
Denied antecedent contact	17	4
Apparently willing to coöperate but giving information so indefinite or incorrect that it did not serve to identify persons named	236	55
Willing to coöperate and giving information leading to the identification and location of persons named	134	31
Total	431	100
Lost from observation before investigation was instituted	33	
Total	464	

As shown in Table I, investigation failed in 14 per cent of the cases because of the patient's unwillingness or inability to give essential information. This group (61 cases) includes 10 instances

in which the attending physician declined to give information, and 17 persons who denied having had sexual contact. Ten persons admitted sexual contact but declined to reveal the identity of the persons concerned, and 8 refused to divulge any information. The remaining 16 admitted contact only with their marital partners, who on examination were either non-syphilitic or were infected subsequently and were therefore not the source of infection of the initial case.

It appears at first glance that a larger proportion of the patients were fully coöperative, since the information which they gave led to the identification, location, and interview of the persons specifically named as sources of infection. It is not certain, however, that the figure given has precisely this meaning since only one-half of the antecedent contacts identified were clearly proved to be suffering from syphilis in a presumably infectious stage. In the remaining cases the information given led only to persons who on examination were found to be non-syphilitic or showed evidence of syphilis which was presumably non-infectious. It may be doubted whether the information originally given was complete. If these patients were to be transferred to the uncoöperative group, where they perhaps properly belong, the effect would be to double approximately the number in this class and reduce by one-half the number certainly coöperative.

Between the extremes of definite refusal to coöperate and effective coöperation as verified by the result, is a large class, 55 per cent of all 431 patients, who either professed to be unable to identify their contacts by name and address or gave information which could not be verified by locating the persons named. Of the 47 females included in this group, 20 were public prostitutes and a large part of the remainder might be classed as clandestine prostitutes.

The 189 males were for the most part individuals who named as their sources of infection prostitutes, or women who had been picked up on the streets or in dance halls.

Under the conditions of this study, the principal cause of failure seemed to be the inability of the patients to give definitive information, because of their lack of personal acquaintance with the persons from whom infection was contracted, rather than actual refusal to coöperate. However, it is quite possible that some of those who appeared to coöperate were in fact withholding information. If this were true, more diligent effort might have improved materially the end results. In so far as failure was due to the informant's own lack of knowledge, it is not certain that more persistent effort would have yielded different results.

The antecedent sexual contacts of the 134 cases in which investigation resulted in the location of one or more of the persons specified, numbered 197 individuals, while those of the 236 cases in which contacts were designated but could not be located, numbered 240. In addition, the 236 patients admitted contact with an unknown but considerable number of persons whose names they had not tried to ascertain. Ninety per cent of the contacts of the fully coöperative group were residents of Buffalo as compared with 50 per cent of the 240 contacts designated but not located. Thirty per cent of the contacts in which the investigation was successful were commercial or clandestine prostitutes, as compared with 75 per cent of those in which individuals were named but not located. Forty-nine per cent of the contacts in successful investigations were friends or acquaintances of the initial cases but this was true of only 23 per cent of those in cases when individuals were named but not located. Of the contacts designated and located 21 per cent were

marital partners as compared with 2 per cent of the named contacts who could not be found.

These findings are such as might be expected from the manner in which the two groups of patients were classified. Other factors not susceptible of measurement were in all probability concerned in the success or failure of the investigations of the 464 initial cases.

By investigating the original 464 cases, 66 infectious syphilis cases were discovered among antecedent contacts, that is, contacts with infectious syphilis were found for 14 per cent of the cases. Twenty-six of the initial cases were apparently infected by a marital partner. Excluding cases so infected, 9 per cent of the initial cases had been in contact with infectious cases of syphilis. In other words, assuming generally accepted views as to stages of syphilis in which the disease is transmissible, the source of infection was found for 14 per cent of all cases and for 9 per cent of cases other than those maritally infected.

The coöperation of 134 initial cases was attested by the location of most of their designated contacts. The contacts named by 4 of the 134 patients refused examination. Ninety-four of the remaining 130 patients gave histories of contact with one, and 36 with more than one, person. In the latter group, 16 patients admitted contact with "several" or "many" persons. In designating the probable source of infection of each case, contacts found to have infectious syphilis were chosen in preference to contacts with latent syphilis or apparently non-syphilitic. The status with respect to syphilis, of the 130 contacts selected as probable sources of infection, according to the method described is given in Table II.

The table shows that 51 per cent of the suspected sources of infection were suffering from presumably infectious

syphilis. This proportion, while large, is perhaps less rather than greater than one would expect to find.

TABLE II

*Results of the Examination of Antecedent Sexual Contacts of 130 Coöperative Initial Syphilis Cases, Buffalo, N. Y., 1935-1937 **

Stage of Syphilis of Antecedent Contact at Time of Contact with Initial Case	Number and Per cent of Initial Cases in Antecedent Contact with Persons in Various Stages of Syphilis	
	Number of Cases	Per cent of 130 Cases
Infectious syphilis	66	51
Presumably non-infectious syphilis	32	25
Syphilis, status as to infectivity unknown	17	13
Non-syphilitic	15	11
Total	130	100

* These results do not include all antecedent contacts examined, but only the "most infectious" contact of each initial case. Thus, if a given individual admitted contact with two persons, one of whom was found to have infectious syphilis, and the other to be non-syphilitic, the former person was selected. In other words, results are given in terms of most probable sources of infection.

The 32 patients whose examined contacts were believed to be non-infectious syphilitics include 13 individuals who admitted contact with other persons. These additional contacts could not be found but might have been the true sources of infection. The remaining 19 maintained that the persons identified and examined were their sole contacts. These 19 patients together with the 15 others whose contacts were apparently non-syphilitic are of considerable epidemiological interest. If there were any way of proving that the information they gave was reliable, the possibility of the transmission of syphilis in other than its early infectious stages and by persons without clinical manifestations of the disease would suggest itself.

SUBSEQUENT CONTACTS

The contacts of the 464 initial cases subsequent to date of infection were investigated in exactly the same manner as the antecedent contacts. Excluding the 33 lost from observation, the remaining 431 are classified in Table III according to their apparent willingness to give information as to subsequent contacts.

TABLE III

Success Achieved in Obtaining Information Which Might Lead to the Identification and Examination of Persons Exposed to Infection by Initial Syphilis Cases—Buffalo, N. Y., 1935-1937

	Number of Initial Cases	Per cent of Investigated Cases
Declined to give information	21	5
Denied subsequent contact	280	65
Apparently willing to cooperate but giving information so indefinite or incorrect that it did not serve to identify persons named	48	11
Willing to cooperate and giving information leading to the identification and location of persons named	82	19
Total	431	100
Lost from observation before investigation was instituted	33	
Total	464	

The cases in which subsequent contact was denied was 65 per cent, as compared with 4 per cent with a denial of antecedent contact. Only 11 per

cent of the patients belonged to the class of individuals willing to cooperate but giving unsatisfactory information as to subsequent contacts, whereas 55 per cent of the same patients were in this group with respect to their antecedent contacts. The proportion of patients willing to cooperate and giving identifying and locating data, 19 and 31.0 respectively, were not significantly different for subsequent and antecedent contacts.

The 82 cooperative patients gave histories of sexual contact subsequent to infection with 112 individuals, of whom 60 were marital partners and 52 were extramarital contacts. Of these 112 persons, 92 were located and 90 examined, and 76 were found to have syphilis.

In evaluating these results, consideration must be given to the fact that many subsequent contacts were also contacts prior to the date of the patient's infection. In fact, it was determined that the dates of infection of 21 syphilitic individuals who were both antecedent and subsequent contacts antedated the dates of infection of the initial cases to which they were related. In presenting findings in Table IV as to the status with respect to syphilis of the 90 subsequent contacts examined, account is taken of the 28 individuals examined who were both antecedent and subsequent contacts.

Since the date of infection of each subsequent contact is believed to have been later than that of the initial case,

TABLE IV

Results of Examination of 90 Subsequent Contacts of 82 Coöperative Initial Syphilis Cases—Buffalo, N. Y., 1935-1937

Status of Contact as to Syphilis	Subsequent Contacts	Antecedent and Subsequent Contacts	Total
Infectious syphilis	43	11	54
Presumably non-infectious syphilis	2	7	9
Syphilis, status as to infectivity unknown	10	3	13
Non-syphilitic	7	7	14
Total	62	28	90

it appears that 43 individuals contracted syphilis as the result of exposure to an initial case. Fourteen individuals exposed to the initial case both prior and subsequent to infection were negative upon examination. Hence, of 57 non-infected persons known to have been exposed to early syphilis, 43, or 75 per cent, contracted the disease. This high proportion is of interest in comparison with the proportion of coöperative initial cases for which an antecedent contact with infectious syphilis was found, namely 51 per cent, and indicates failure to discover the actual source of infection in many instances.

CONTACT INVESTIGATION AS A CASE FINDING PROCEDURE

From the health officer's point of view, the object of investigating cases of early syphilis is to discover new infectious cases and to bring such cases under supervision and treatment. The question arises as to whether the case investigations in the present study fulfilled the purposes for which they were intended, and were sufficiently successful to warrant carrying them on permanently.

During the study, 461 contacts were named and 275 located and examined. Of the 275 examined, 233 were sexual contacts and 42 were incidental contacts, for the most part members of the same household as the initial case.

Among the 275 contacts, there were 202 cases of acquired syphilis and 2 of congenital syphilis of whom 55 were themselves initial cases; that is,

although the individual concerned was reported to the Health Department independently, and was accordingly defined as an initial case, investigation revealed that he or she was also a contact of another initial case.

Exclusive of these 55 contacts who were themselves classed as initial cases, there remain 149 syphilis patients brought into the record during the study, 97 of whom were already known to the Health Department, and all such cases had received some sort of treatment. Thirty-four of the 97 cases were delinquent in treatment at the time they entered the study.

Thus, the study resulted in the finding of 52 new syphilis cases, not under treatment or without histories of previous treatment. Of these 45 were among individuals with presumably infectious syphilis.

A larger series is now being collected in Buffalo, not only for the purpose of evaluating case investigation as an administrative procedure but also with the hope of adding to our knowledge of the epidemiology of syphilis. There are many facts regarding the transmission of the disease which remain unknown, and in general these facts are of such a nature that they must be determined by field observations on human beings. The problem as it now presents itself seems to be twofold: (1) reaching a decision as to practicable control methods, and (2) acquiring knowledge as to the essential details of the epidemiology of syphilis.

Nutrition Services in Maternal and Child Health Programs Under the Social Security Act*

MARJORIE M. HESELTINE

Specialist in Nutrition, Children's Bureau, U. S. Department of Labor, Washington, D. C.

THE claim of nutrition to a place in a maternal and child health program rests on two major premises: (1) that good nutrition is essential to optimal development; and (2) that the nutritional status of mothers and children can be improved by educational activities. The relation of nutrition to the growth and development of children is too well established for discussion at this time. The far reaching effects on public health of good nutrition of mothers during the childbearing period has been given vigorous expression by two Scottish writers in a recent notable review of¹ the dietary requirements during pregnancy and lactation. I quote from the summary:

Since the maternal diet in pregnancy and in lactation inevitably affects the well-being of the infant, the health of the whole population depends to a greater or less extent on the feeding and nutrition of the mothers.

In some branches of public health, recognition of the importance of any single health factor leads to direct action as well as to educational activities. Children whose parents cannot arrange with the family physician for immuni-

zation against diphtheria are protected at public health conferences. But children whose parents are not providing adequate food and the other essentials of good nutrition are not protected against undernutrition or malnutrition by the direct action of the health department, except by an occasional sample of cod liver oil or canned or dried milk received at an infant or pre-school conference. The nutrition services carried on by a maternal and child health division are almost entirely educational in nature; education of the families and individuals to make the most of whatever resources they have, and education of public and private agencies in the community to the need for supplementing inadequate resources.

Have we any evidence that education in nutrition results in healthier children? Emboldened by hearing an eminent statistician assert that we do not need to be in doubt about everything that has not been proved to have statistical significance, I venture to say "yes." There have been only a few attempts to study the influence of nutrition teaching but these few give us courage to go on. Doubtless many of you can add from personal experience to the studies that come to my mind: the retardation of dental caries among children attending the nutrition clinic

* Read before a Joint Session of the Food and Nutrition, Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

of the Forsyth Dental Infirmary²; the improvement during 4 of the leanest depression years in the nutritional condition of preschool children examined by pediatricians and dentists on the staff of the Massachusetts Department of Health³; and, still nearer home, the gratifying findings regarding the influence of education on the food purchasing habits of low-income city families studied by the Association for Improving the Condition of the Poor of New York City.⁴

As in other activities for human betterment, much of the pioneering in community nutrition was done by far sighted private agencies. Years before the passage of the Social Security Act, however, a few state departments of public health, either convinced by scientific evidence or acting upon faith, inaugurated nutrition services. The Health Departments of Massachusetts, Connecticut, and New York have maintained such services continuously for more than 10 years. At least 4 other states had employed nutritionists at some time in the past—when federal funds were available for maternity and infancy services or when state legislatures were relatively liberal in making appropriations for public health. It seems safe to say, however, that the principal stimulus to the establishment of nutrition services in maternal and child health programs of public agencies has been through Title V, Part I of the Social Security Act, which authorizes the Secretary of Labor to make grants-in-aid to the states for the extension and improvement of the health of mothers and children, especially in rural areas and in areas suffering from severe economic distress. In advising the Children's Bureau on the administration of maternal and child health services under the Social Security Act, the State and Territorial Health Officers have mentioned the extension of nutrition programs among the public health

activities for which federal funds may be used.

Two of the 3 states that pioneered in the continuous maintenance of nutrition programs have taken advantage of social security funds to add workers to their staffs. Two states that were forced to abandon nutrition programs during the economic doldrums have reinstated the service. Ten states have set up nutrition services in their health departments for the first time. The most recent reports to the Children's Bureau indicated that on September 1, 1937, 15 states were employing a total of 27 nutritionists. In all but one of these the chief nutritionist serves on the staff of the maternal and child health division. In Connecticut the nutritionist heads a division of nutrition and health education. In Massachusetts a supervisor and 7 nutritionists are attached to the maternal and child health division and 2 more nutrition workers, who serve in the division of tuberculosis control, receive technical supervision from the nutrition supervisor. In New York 3 nutritionists serve on the staff of the maternal and child health division and a fourth is assigned by the State Health Department to a project for staff education in a city health department.

The pediatricians or obstetricians who constitute the majority of state directors of maternal and child health have shown interest in and understanding of the contribution of nutritionists to their programs. They have also been quick to realize that nutrition plays a part in other aspects of public health. It is safe to say that no nutritionist has failed to render some service outside the maternal and child health division of the state health department, notably in dental hygiene, public health education, tuberculosis control, and diagnostic clinics for crippled children. When she is assigned to a local health agency, she is, of course, responsible

directly to the local health officer and carries on a general program that includes consulting with the staff and participating in their services to families and individuals.

The question naturally arises why nutritionists have not been employed in all states and territorial possessions that receive federal funds under the maternal and child welfare title of the Social Security Act. The answer is the same as to the question why no two states have submitted identical plans for maternal and child health services. State plans, as formulated by health department officials in consultation with representatives from the Children's Bureau, take into consideration both state needs and state resources. In some states nutrition education in rural areas is already more highly developed than the medical and nursing services given by public health agencies. If a highly organized agricultural extension service and a state department of vocational education are carrying on educational work in nutrition and are reaching the people toward whom the maternal and child health program is also directed, the health department does well to rely upon these resources, at least while it is building up its own organization to the point where it can furnish intelligent guidance to its own nutrition worker and make effective use of her services. Many state plans recognize that nutrition is an integral part of a well rounded program of maternal and child health and make some provision for incorporating effective nutrition teaching in the day-to-day service of the public health nurse and the physician conducting a health conference.

Dr. Morris* has offered convincing evidence from Delaware that a worth while nutrition program can be carried

out when two state agencies share in the employment of a well trained nutritionist. Several state health departments that have not been able to appoint a staff nutritionist for the present are using existing resources in the state to help solve outstanding nutritional problems. The serious health situations resulting from the drought of the summer of 1936 led to concerted efforts by health, welfare, and educational agencies in some of the states that suffered most severely. In South Dakota extension service workers, rural rehabilitation home supervisors, home economics teachers, and public health workers have formed a united front in a campaign of education and services to safeguard the health of mothers and children in drought areas. Through the efforts of state workers, nutrition and health councils have been formed in a majority of the counties. Educational material recommended by the state nutrition council as particularly well suited to different teaching situations is being used throughout the state. School lunches are being fostered by community leaders. The belief is widespread that some of the worst consequences of the drought in South Dakota have been averted by the concerted action of the agencies most immediately concerned with food, nutrition, and related health problems.

Although much can be accomplished in promoting good nutrition as a public health measure without drastic change in the personnel of state and local health departments, many state directors of maternal and child health look forward to the eventual appointment of at least one nutritionist as a staff consultant. The regional and special consultants of the Children's Bureau encourage states to appoint one or more nutritionists when the groundwork for a successful program has been laid. Even a single worker in a large state can increase the effectiveness of the

* See Morris, Woodbridge E. Nutrition Program in a State Department of Health. *A.J.P.H.*, June, 1938, p. 718.

nutrition services in the maternal and child health program if sufficient thought is given to the best use of her time and energy.

The activities of the state nutritionists now in service vary considerably in detail, but little in broad general outlines. Perhaps the major responsibility of the staff nutritionist is staff education so that all public health workers who come into direct contact with the public may be in agreement as to fundamentals of nutrition in relation to maternal and child health. The statement is often made that one of the functions of the nutritionist is to keep her public health colleagues informed on what is new in the field of nutrition. Probably a more important function is to keep them informed on what is *still true* in nutrition and on how to teach these generally accepted principles so persuasively and understandingly in terms of everyday food practices that mothers and children form good habits which will withstand the onslaughts of the most uninhibited of food faddists. To aid the effectiveness of nutrition teaching in the home visit, the health conference, the school inspection, the classroom, or the occasional lecture, the nutritionist assembles and evaluates teaching aids, such as bulletins, posters, films, and exhibits. Most workers find it advisable to make full use of all appropriate material from governmental and other reliable sources and to prepare within the state only what is not available elsewhere.

If staff education is the first responsibility of the nutrition consultant, coordination of the nutrition work of allied agencies is a close second. Just as the dental-health consultant interests local dentists in the oral hygiene program of the state department of health, so the nutritionist enlists the interest and support of individuals engaged in educational and service activities related to food and nutrition. The list

of people who can contribute to a public health program in a community may be a long one: the county home demonstration agent and 4-H club leader, the county home supervisor for the rural rehabilitation program, teachers of home economics, welfare workers, school administrators and teachers (including nursery school teachers), school lunch administrators, and others. As a state worker, the department of health nutritionist usually makes her first contact with the state leaders in the fields just listed and by so doing often finds that the way has thereby been paved for good working relationships on a county or community basis.

The extent of direct service that a state nutrition staff can give is perforce strictly limited. When the special maternal and child health demonstration in progress in a state either features or includes nutrition work, the nutrition consultant is often able to give some intensive service within that area. If the demonstration area also serves as a center for the field training of new staff nurses, staff education can be carried on under the realistic conditions of a local health unit. When several nutritionists are employed, participation in child health conferences is often possible on a permanent basis, as a means for training nurses or qualified volunteer workers in the technic of the nutrition consultation. Many nutritionists consider that some work in a local health department and some direct contact with mothers and children is indispensable to meaningful consultation service but recognize that the most far-reaching contribution they can make to a county or community program is through developing local resources for continuing participation in the work of the local unit. One or two inoculations may bring lifelong immunity to specific diseases, but the campaign for good nutrition is a never ending fight

against indigence, ignorance, and inertia.

REFERENCES

1. Garry, R. C., and Stiven, D. A Review of Recent Work on Dietary Requirements in Pregnancy and Lactation, with an Attempt to Assess Human Requirements. *Nutrition Abstr. & Rev.*, 5, 4:855 (Apr.), 1936.

2. Howe, P., White, R., and Rabine, M. Retardation of Dental Caries in Out-patients of a Dental Infirmary. *Am. J. Dis. Child.*, 46, Part I; 1045 (Nov.), 1933.

3. Coffin, S. M., and Beinert, F. L. Nutrition on the Well Child Conference. *The Commonwealth*, 23, 1:40-6 (Jan.-Feb.-Mar.), 1936.

4. Gillett, L. H., and Rice, P. B. *Influence of Education on the Food Habits of Some New York City Families*. New York Association for Improving the Condition of the Poor, 1931.

Length of Life

. . . Again it will have been noted that no advice has been given this evening about how to conduct life so to live long. The reason for this omission is simple. I am not a medical man. It is the proper professional business of medical men to instruct and advise people about healthy and continued living. They have done well at it, and their collective wisdom about it waxes day by day. On the other hand, detached observation suggests that when laymen take on the job, as all too many of them love to do, the results have not been quite universally all that could be desired. Some conspicuous examples could be cited by way of illustration of this point, without having to wander very far geographically. The truth is,

as every physician knows, that human life and living are extremely complicated matters, not amenable to simplification by formula or to amelioration by panacea. Really helpful advice about unravelling these complications will come only from the wisdom that grows out of experience and knowledge. The purity of heart and nobility of purpose of bustling "do-gooders" or the ready omniscience of gentry eminent in branches of science other than medicine are poor surrogates for the real knowledge and wisdom of the seasoned medical practitioner in the search for longevity.—Pearl Raymond. "Lectures to the Laity," New York Academy of Medicine, February 24, 1938, *Sci. Month.* May, 1938.

Accuracy of the Cancer Death Records*

ELEANOR J. MACDONALD, F.A.P.H.A.

Epidemiologist, Division of Adult Hygiene, State Department of Public Health, Boston, Mass.

THE challenge to statisticians to prove that data upon which extensive biometrical methods are used and from which conclusions are drawn are basically accurate enough to warrant this expenditure of effort or to justify the conclusions drawn, suggested the need for appraisal. This study is concerned with the soundness of the data contained in the cancer death records.

The general use of autopsy for exact verification of doubtful diagnoses does not seem imminent. Only about 12 per cent of the cancer deaths at the present time come to autopsy, and these in no sense represent a cross-section of the cancer population. With the limitation in autopsies, the method employed in this study furnishes a reasonable evaluation of the cancer death records.

The late Robert B. Greenough advised checking the accuracy of the information on the cancer death records by interviewing those who were related to or associated with the deceased. The state-wide interest in the cancer program, in effect in Massachusetts since 1926, with the consequent rational attitude toward the disease as an entity, would presuppose a coöperative attitude toward the study. It was an extensive undertaking, financed in part by the Rockefeller Foundation, and coöperated

in enthusiastically in practically every instance by that portion of the population interviewed—approximately 15,000 individuals. Whether, in view of the state cancer-program in operation for the past 10 years, the findings in Massachusetts could be applied to other states is problematical.

The death records were first copied on a special card prepared for the purpose. In addition to the name and address of the individual, the death record contains information concerning the cause of death, date of birth and death, nativity, date of first recognizable symptoms, the operative history, the place of death, any associate cause of death, the record of an autopsy if one were performed, and the name of the individual who signed the certificate.

Comparable information was obtained from the family, every physician employed, hospitals attended, and social workers who knew the case.

There were 6,153 deaths from cancer in Massachusetts in 1932. Since several interviews were required for every completed case record, it was necessary to sample the deaths rather than to attempt to obtain information on every single death for the calendar year. It was predetermined that completed records of one-third of the total deaths should be secured. This necessitated at least one visit to the residences of about one-half of the individuals who had died of cancer in Massachusetts in 1932. The family was visited first in every instance. From this source the

* Read before a Joint Session of the Association of State Registration Executives and the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

names of the physicians employed, as well as the hospitals attended, the social workers, and others familiar with the case could usually be obtained. When the family and physicians of one of these cases could not be reached, the case was not followed further. This caused the rejection of approximately 1,000 records after one or more contacts had been made, since records with insufficient data were discarded.

An attempt was made to draw the true picture of the life of the cancer patient from the material thus obtained, and to note differences between this picture and that furnished by the death record itself. While it is realized that in some instances accurate details may not have been obtained, it is believed that in most cases the verified data represent the actual facts.

The sample of cancer deaths surveyed was 32.9 per cent of the total for 1932. That the sample was representative by site of cancer is evidenced by the fact that the distribution in the surveyed population of the several sites studied shows no significant difference by chi-square test from the distribution by site in the total Massachusetts cancer deaths for 1932 (chi-square = 4.9 and $n = 8$). This shows that this sample is representative of the Massachusetts cancer deaths by site for 1932. The geographical fairness of the sample had been assured by having the surveyors collect a certain number of records from each part of the state.

The verified data were in complete agreement with the death records on the question of sex, as was to be expected. Discrepancies as to age were so slight as to be practically negligible. Only an occasional case differed more than a year from the recorded data. Nativity was correct in over 99 per cent of the records. One may assume that the age, sex, and nativity information furnished by the death record is accurate.

The question of operations was reasonably accurate with agreement occurring in 93.7 per cent of all cases. A reasonable accuracy was present in the associate cause of death with agreement occurring in 92.0 per cent of all cases.

The duration of cancer is the least reliable information on the death record. Agreement between the death records and the facts learned in the survey occurred in only 22.8 per cent of the records. This item of information is frequently entirely omitted from the record, and was missing in 53.7 per cent of the cases studied. When the average duration of these cases in which information was available was compared with the verified duration, the true figure was nearly twice as large as that obtained from the death records—13.6 months on the death records and 23.8 months in the survey. From these facts, it is evident that little reliance can be placed on the importance of duration in cancer as determined by the death records.

The most important item from the standpoint of the student of cancer statistics is the value of the record certified as being cancer. The number of cures prevents cancer mortality from being an index of cancer morbidity. With accurate cancer mortality, accurate duration of disease, and a reasonably accurate estimate of the percentage of cures, morbidity can be approximated from mortality data. A death is either certified as being due to cancer or not. The statistician wishes to know how many of those so certified are correct, and how many of those not so certified should have been classified as cancer.

Another problem which is increasing in importance with improved methods of handling statistical data and with better knowledge of the disease is that of the exact primary location of the cancer. The present-day statistician not only wants to know whether or not the patient died of cancer, but also

TABLE I

Comparison of Actual and Death Record Diagnosis

<i>Location of Cancer</i>	<i>Official Death Record Diagnosis</i>	<i>Verified Diagnosis</i>	<i>Complete Agreement</i>	<i>Percentage Agreement with Death Record</i>	<i>Author's Estimate of Percentage Agreement</i>
Buccal Cavity	79	74	66	83.5	84.0
Digestive Tract	1,028	792	776	75.5	80.0
Respiratory Tract	64	53	44	....	....
Uterus	213	191	172	80.8	83.0
Other Female Genital Organs	43	57	33	....	....
Breast	225	246	222	98.7	99.0
Male Genitourinary Organs	169	157	141	83.4	86.0
Skin	28	29	16	....	....
Other and Unspecified Organs	180	209	120	66.7	68.0
Doubtful—Probably Cancer	0	66	0	....	....
Doubtful—Possibly Cancer	0	75	0	....	....
Doubtful—Probably Not Cancer	0	47	0	....	....
Non-Cancer	4	37	0	....	....
Total	2,033	2,033	1,590	78.2	83.0

where the primary lesion originated. The data obtained in the death record survey furnish an answer to all these questions with the exception of the size of the group classified as dying of other diseases that should have been classified as cancer. Inasmuch as only cancer deaths were verified, additional data were obtained to determine the volume of this particular group.

Table I shows the official diagnosis compared with the verified diagnosis, subdivided by broad types of location of cancer. Four cancer cases were not recorded in the official cancer classification because other diseases which the individual had were given precedence over cancer. While these individuals had cancer, they were classified as follows:

1. Sudden death under ether anesthesia preparatory to operation for extensive carcinoma of the stomach

2. Hypostatic pneumonia following a fracture of the left femur; associate cause, cancer of the prostate gland

3. Shock following fracture of the right hip; associate cause, cancer of the lung

4. Shock due to pathological fracture of right femur and left humerus; metastatic lesions from cancer of the breast

While these cases are classified as dying of accident, they all had extensive cancers, and from the point of view of cancer epidemiology might well have been classified under cancer.

A group of 66 cases was probably malignant, although conclusive evidence was lacking. In most of these cases the diagnosis had been based on observation of clinical symptoms by one or more physicians and although the physician or physicians had not had the advantages of consultation, they had treated the patient over a considerable length of time and did not base their opinions solely on observations of the patients in a moribund condition.

A second group comprising 75 cases was classified as possibly malignant. A physician might state he believed this case to be malignant from the symptoms, but because the patient refused sufficient examination or study of the case, he was not certain. An example of this type of case was the woman who refused examination and whose family refused to permit examination of the body even after death, when all the symptoms pointed toward cancer of

the uterus. Another type of case included in this group of 75 was of those individuals who, although they went to a hospital, refused other than palliative treatment, and whose hospital records read "question of malignancy." A third type of case was of those individuals to whom a physician was summoned only a week or so before death. His opinion had to be based on a superficial examination of a moribund individual.

Forty-seven cases were viewed in which the evidence was presumptive of non-malignancy, but not sufficiently strong to warrant a positive statement. Several of the physicians signing records in this group made the statement that their diagnosis of cancer was only a guess. In other cases the hospital records stated positively that the case was non-malignant, while the local physician was equally positive that it was malignant.

Thirty-seven additional cases were definitely not cancer. Several of them at autopsy were found to be other conditions, and the death certificates were evidently written before the report of the autopsy findings. Others had been biopsied a short time before death with negative findings for malignancy. In one case in which the patient died of heart disease, the physician had written on the certificate that this patient was operated on for cancer of the bladder several years previous to that time and had had no recurrence. The fact that cancer appeared on the death certificate caused this to be certified as a cancer death rather than heart disease. In all of these 37 cases the evidence collected from the family, physician, hospital, and autopsy records seemed sufficiently strong to make the dogmatic statement that none of these cases was cancer.

This analysis of the presence or absence of cancer disregarding location indicates that the presence of cancer

as measured by the death certificate is accurate to somewhere between 89 per cent and 98 per cent. This may be even more closely approximated by the assumption that the probable cancers were cancers, and the probable non-cancers were not cancers. This is a reasonably safe assumption as errors in either of the classifications may well be balanced by the other. This would place the actual figure between 92 per cent and 96 per cent.

An exhaustive analysis of those cases classified as "possible cancer" leads one to believe that approximately three-fourths of the cases were cancer. An estimate that cancer as a disease was accurately diagnosed in 95 per cent of the total cases is felt to be a sound one.

A comparison of the diagnosis of the official death record by broad classification of site of cancer with the verified diagnosis disclosed complete agreement in 78.2 per cent of the total cases. If similar assumptions are made regarding the doubtful cases as were made with total cancer, this figure would be increased to 83 per cent. Frequently, the site of metastasis was given rather than the site of the primary lesion. When these cancers were allocated to the correct site, a decrease was found in the number of cases of cancer of the buccal cavity, of the digestive tract, of the respiratory tract, of the male genitourinary organs, and of the uterus. An increase was apparent in other female genitals, breast, and cancer of other and unspecified organs. Cancer of the skin was practically the same. From Table I the inference is drawn that site of cancer is not particularly well defined on the death record.

This is even more graphically shown in Table II where the broad classifications are subdivided into smaller units. Complete agreement was present in 70.9 per cent of the total cases. If the same assumption as was made above is repeated, this figure may be as high as

TABLE II
Comparison of Actual and Death Record Diagnosis

Location of Cancer	Official Death Record Diagnosis	Complete Agreement	Percentage Agreement with Death Record	Author's Estimate of Percentage Agreement
Lip	7	7	....	....
Tongue	18	11	....	....
Mouth	14	5	....	....
Jaw	17	13	....	....
Other Buccal	20	12	....	....
Pharynx	3	1	....	....
Esophagus	38	33	....	....
Stomach	379	292	77.0	80.0
Intestines	290	211	72.8	75.0
Rectum and Anus	109	78	71.6	75.0
Liver, Biliary, Gall-bladder	126	22	17.5	20.0
Pancreas	57	44	....	....
Peritoneum	2	0	....	....
Other Digestive	27	0	....	....
Larynx	12	7	....	....
Lungs and Pleura	45	32	....	....
Other Respiratory	7	0	....	....
Uterus	213	174	81.7	85.0
Ovarian and Fallopian Tube	39	27	....	....
Vagina and Vulva	4	3	....	....
Breast	225	223	99.1	99.0
Male Kidney	14	11	....	....
Male Bladder	53	30	....	....
Prostate	98	85	86.7	90.0
Testes	1	1	....	....
Scrotum	1	1	....	....
Others of This Class	2	2	....	....
Skin	28	16	....	....
Female Kidney	14	8	....	....
Female Bladder	21	14	....	....
Brain	13	11	....	....
Bones except Jaw	9	8	....	....
Others and Unspecified	123	60	48.8	50.0
Non-Cancer	4	0	....	....
Total	2,033	1,442	70.9	75.0

75 per cent. The greatest discrepancy appeared in cancer of the liver, biliary passages, and gall-bladder where complete agreement occurred in only 17.5 per cent of the cases. Again, repeating the previous assumption, this figure may be as high as 20 per cent. This is due to the practice, which is still common although far less so than previously, of certifying a death record as being cancer of the liver rather than cancer of the original site.

These findings warrant conservatism in any discussion of cancer by location of organs affected in which mortality figures are used, but are much better than one would be led to believe by reviewing some of the literature.

These figures indicate a more accurate record diagnosis than was shown by Lund and Hoffman¹ in their study from 1918 to 1930. They found 31 per cent of mouth cases recorded as dying of cancer outside the buccal cavity. In

this study 16.5 per cent were found. While this sample of buccal cavity cancer is smaller and subject to more statistical fluctuation, the great difference would indicate that certification in 1932 was far better than the sample of Lund and Hoffman with the median year of death 1921. This points toward an improvement.

A compilation from the literature of 6 studies on autopsies in which the data have been reported so that comparison is possible has been combined in Table III with a review of records from the Massachusetts General Hospital of autopsies performed from January, 1928, to July, 1937, inclusive. This table shows the cases that were clinically diagnosed as cancer, those that were erroneously diagnosed as cancer, and the missed cases that were found only at autopsy. The percentage of erroneously diagnosed cancers varied from 2.2 in Lubarsch's study² to 12.0 in that of Bilz.² The Massachusetts General Hospital figure of 8.4 is in close agreement with 3 of the other studies and is also the median for the series. While attempts are made at the Massachusetts General Hospital to obtain autopsies on as many bodies as possible, the fact that this hospital receives ma-

terial which is difficult to diagnose clinically from all New England, makes its autopsy series a specialized group. Moreover, the cancers by location differ from a cross-section of cancer deaths, and if adjustments were made for these two items alone the rate for erroneously diagnosed cases would not differ greatly from the estimate made from the survey.

This strengthens the belief that 5 per cent erroneously diagnosed cases is close to the correct figure.

The number of missed cases per 100 erroneously diagnosed cases at the Massachusetts General Hospital was 230. In 2 of the other studies this figure was 244 and 264 respectively. The records of the Massachusetts state-aided cancer clinics show 220 originally diagnosed as non-cancer and later changed to cancer, to every 100 first diagnosed as cancer and later changed to non-cancer. Inasmuch as the Massachusetts state-aided cancer clinic cases are followed from first attendance at clinic to death of the patient and are in close agreement with the majority of the autopsy studies, this figure seems suitable to use in estimating the percentage of missed cases. There would thus be between 9 and 18 per cent

TABLE III
Measurement of the Accuracy of Clinical Diagnosis by Autopsy

	Clinically Diagnosed Cancer	Erroneously Diagnosed (Clinically Diagnosed Cancer— Found to be Non-cancer at Autopsy)	Missed Cases (Clinically Diagnosed Non-cancer— Found to be Cancer at Autopsy)	Percentage of Erroneously Diagnosed Cancer	Missed Cases per 100 Erroneously Diagnosed Cancer
Wells ²	400	33	178	8.2	539
Lubarsch ²	7,426	163	1,312	2.2	205
Bilz ²	600	72	60	12.0	83
Ritterhaus ²	405	13	48	3.2	369
Riechelmann ²	613	58	156	9.5	261
de Vries ²	1,102	102	249	6.5	244
Current Study—Massachusetts General Hospital	677	57	151	8.4	230

missed cases, the most probable figure being 11 per cent.

The total error in the number of cancer cases reported would be about 6 per cent (11 per cent missed cases minus the 5 per cent erroneously diagnosed cases). If 6 per cent were added to the number of recorded deaths in Massachusetts, a figure would be obtained which would closely approximate the actual cancer mortality.

The analysis of these data indicates that in Massachusetts identification of cancer deaths is sufficiently accurate to warrant statistical compilations on age,

sex, nativity, and the disease as a whole. There is a considerable error in exact location of cancer and a large error in duration of disease, and the statistician should not draw conclusions on these data without making corrections for errors known to exist.

REFERENCES

1. Lund, Charles C., and Hoffman, Virginia. The Accuracy of Death Certificate Diagnoses in Cases of Buccal Carcinoma. *New Eng. J. Med.*, 209, 15:719-722 (Oct. 12), 1933.
2. de Vries, W. M. The Prevalence of Cancer as Revealed by Mortality Returns and at Autopsy. Pp. 217-246 of *Cancer Control Report of an International Symposium held under the Auspices of the American Society for the Control of Cancer, Lake Mohonk, New York, U. S. A., September 20-24, 1926*. Surgical Publishing Co., Chicago, 1927.

Tobacco, Alcohol, and Longevity

... The net result is obvious. In this group of nearly 7,000 men the smoking of tobacco was associated definitely with an impairment of life duration, and the amount or degree of this impairment increased as the habitual amount of smoking increased. The contrast between the life tables relative to the implied effects upon longevity of moderate smoking, on the one hand, and the moderate use of alcoholic beverages, on the other hand, is very striking. The moderate smokers in this material are definitely shorter lived than the total abstainers from tobacco; the moderate drinkers are not significantly

worse or better off in respect of longevity than the total abstainers from alcohol.

Heavy indulgence in either tobacco or alcohol is associated with a very poor life table, but the life table for heavy smokers is definitely worse than that for heavy drinkers up to about age 60. Thereafter to the end of the life span the heavy smokers do a relatively better job of surviving than the heavy drinkers. But neither group has anything to boast about in the matter of longevity.—The Search for Longevity, by Prof. Raymond Pearl, *Sci. Month.*, May, 1938, p. 480.

Precision Methods in the Determination of the Heavy Metals*

LAWRENCE T. FAIRHALL, PH.D.

*Principal Industrial Toxicologist, U. S. Public Health Service,
Washington, D. C.*

A CERTAIN amount of the chemical work in industrial hygiene requires only routine procedure of the conventional type—such as the determination of the amount of a given constituent in air samples, the analysis of factory products, or of raw materials, the analysis of rafter dusts or of water samples. Such work requires only ordinary care and average skill to yield perfectly satisfactory results. Furthermore, a routine procedure is usually quite sufficient for the accuracy desired or necessary.

There are phases of investigation in industrial hygiene, however, that require the highest type of chemical skill, yet it appears to be quite generally the case to relegate such work to a routine analyst. It is obvious that an investigation, no matter how ambitiously projected, is no better than the physical data collected, or the analytical figures upon which it is based. A special plea is therefore made, not necessarily for simpler, but for more precise methods and for more careful evaluation of the results obtained. This may entail more work, time, and expense than an investigation would appear to warrant; but it is a question whether such a rapidly increasing field

as industrial hygiene would not be better served eventually. A poor job is not only a poor job—it multiplies the later work of others in the same field.

One of the major undertakings yet to be done in industrial hygiene is the question of methods of analysis. In spite of all the work that has been accomplished, this will be true for some time to come. Just as the great advances in biochemistry have been conditioned and fostered by more and more exacting methods of analysis, the ground work and basis of industrial hygiene is that of its analytical data.

In a sense this is uninteresting work. As in analytical chemistry in general, nothing basically new is added in working out a method of analysis. Rather it consists in adaptation of recognized methods to a specific or unique problem. Occasionally a conventional procedure is discarded entirely and a breathtaking short-cut substituted, as shown in analytical spectrography, but even here its validity must be based on recognized procedure of the highest order.

I propose to confine myself to selected phases of analytical procedure, rather than to a detailed discussion of analytical methods. The methods of analysis are constantly changing to meet new or unforeseen conditions, and this shows a healthy and fortunate tendency. There are two directions in

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

which these changes occur: one in the direction of simplification and rapidity; the other toward greater accuracy. The former meets the pressure of routine output; the latter may need some explanation—but no justification surely. The higher degree of accuracy is needed more in specialized investigations of industrial toxicology. It is with the latter that I propose to deal here and to discuss certain phases of the analytical problems with which we recently have been concerned.

We no longer have the massive exposure to injurious substances that was true only a few years ago in industry. Great improvements have been made in preventive control. Therefore the problems of occupational disease are more difficult because the actual degree of exposure is smaller—smaller amounts of poisonous materials are involved—and the clinical pictures of various intoxications are modified in similar fashion. For instance, lead is still the ranking industrial poison, yet control measures are so good that the degree of exposure of workers in a modern factory is very low and the actual number of cases of typical lead poisoning is steadily diminishing.

With respect to the heavy metals, investigations in industrial hygiene are concerned with quantities that are very small. Unfortunately these very small amounts are concealed in quantities of biological material which are enormously large in proportion. Thus, a significant amount of a metal in a day's output of urine of 1,500 c.c. may be 30 or 40 micrograms. This represents a concentration of 3 or 4 parts in 150,000,000. Furthermore, organic material notoriously interferes with the chemical determination of the heavy metals and must be removed. In the determination of the total arsenic content of a human liver, say, this becomes a very difficult problem. Therefore I would like to discuss two things that betray more than

anything else the difficulties of such analytical procedure.

DRY ASHING PROCEDURE

It is well known that one of the most troublesome operations in the determination of the tissue or excreta content of the heavy metals is that of ashing. At the same time, nothing can contribute so much to lack of precision as the process of removal of organic material. In spite of this, however, the amount of attention that has been directed to this problem is out of proportion to its importance. With such metals as arsenic, cadmium, antimony, and mercury, dry ashing is of course out of the question. However, in certain cases dry ashing is exceedingly useful if it can be safely employed, although it requires great care and patience to carry out properly. The extraction of the ash must not only be thorough, but one must not overlook the possibility of the formation of insoluble phosphates or silicates at the temperatures employed. This means that *all* residual material—commonly supposed to be "silica"—must be carefully dissolved and added to the acid extract. Unless this is carefully attended to, the resulting analysis may be tremendously in error.

From time to time the possibility of loss in ashing as a result of using too great a temperature is pointed out. However, very little work has been reported with respect to losses in ashing at various temperatures.

In a recent study made with respect to lead losses in ashing we found that the nature of the compound is of some importance. Owing to the predominance of chlorides in tissues or excreta there is the possibility of formation of lead chloride which is rather volatile compared with other lead salts. Known amounts of lead as chloride were heated in platinum dishes for similar lengths of time in an electric muffle

furnace in which the temperatures could be measured by means of a carefully calibrated pyrometer. The lead could be quantitatively recovered in those cases in which the temperature never exceeded 500° C. At 600° C. losses began to be evident and at 750° C. they were serious, amounting to some 40 per cent. With lead phosphate, however, losses did not begin to occur until a temperature of 750° C. had been reached and even at 850° C. amounted to only a few per cent. These experimental data are shown graphically in Figure I in which the lead recoveries are plotted together with the vapor pressures of lead chloride.¹ In addition to the chloride and phosphate alone, lead carbonate alone, and chopped meat to which lead chloride had been added, were ashed at temperatures intermediate between those in which losses occur with the chloride and phosphate—with no evidence of loss of lead. It is evident, therefore, that so far as lead is concerned, an

ashing temperature of 500° C. is perfectly safe.

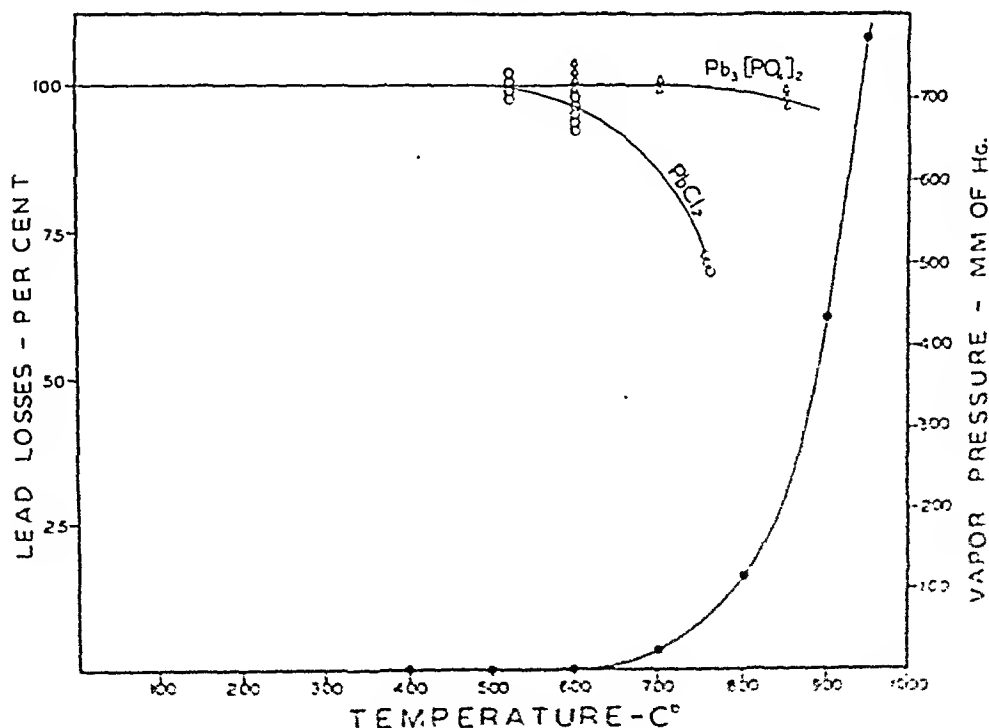
WET ASHING PROCEDURE

While dry ashing is exceedingly useful for several of the heavy metals, it is frequently slow and time consuming and requires more or less constant attention. It is particularly difficult to ash any quantity of blood or liver because these substances tend to form a tarry mass on charring that swells or puffs up into a mass of spongy carbon several times the volume of the original substance. Because of this and because of possible loss with several of the more volatile heavy metals, we have attempted to find a more nearly universal method of ashing that would satisfy exacting requirements.

A study was made of the usual oxidizing materials—nitric, perchloric, permanganic, and sulphuric acids, chlorine, nitrosyl sulphuric acid, and hydrogen peroxide.

There are objectionable features to

FIGURE I



this study 16.5 per cent were found. While this sample of buccal cavity cancer is smaller and subject to more statistical fluctuation, the great difference would indicate that certification in 1932 was far better than the sample of Lund and Hoffman with the median year of death 1921. This points toward an improvement.

A compilation from the literature of 6 studies on autopsies in which the data have been reported so that comparison is possible has been combined in Table III with a review of records from the Massachusetts General Hospital of autopsies performed from January, 1928, to July, 1937, inclusive. This table shows the cases that were clinically diagnosed as cancer, those that were erroneously diagnosed as cancer, and the missed cases that were found only at autopsy. The percentage of erroneously diagnosed cancers varied from 2.2 in Lubarsch's study² to 12.0 in that of Bilz.² The Massachusetts General Hospital figure of 8.4 is in close agreement with 3 of the other studies and is also the median for the series. While attempts are made at the Massachusetts General Hospital to obtain autopsies on as many bodies as possible, the fact that this hospital receives ma-

terial which is difficult to diagnose clinically from all New England, makes its autopsy series a specialized group. Moreover, the cancers by location differ from a cross-section of cancer deaths, and if adjustments were made for these two items alone the rate for erroneously diagnosed cases would not differ greatly from the estimate made from the survey. This strengthens the belief that 5 per cent erroneously diagnosed cases is close to the correct figure.

The number of missed cases per 100 erroneously diagnosed cases at the Massachusetts General Hospital was 230. In 2 of the other studies this figure was 244 and 264 respectively. The records of the Massachusetts state-aided cancer clinics show 220 originally diagnosed as non-cancer and later changed to cancer, to every 100 first diagnosed as cancer and later changed to non-cancer. Inasmuch as the Massachusetts state-aided cancer clinic cases are followed from first attendance at clinic to death of the patient and are in close agreement with the majority of the autopsy studies, this figure seems suitable to use in estimating the percentage of missed cases. There would thus be between 9 and 18 per cent

TABLE III
Measurement of the Accuracy of Clinical Diagnosis by Autopsy

	Clinically Diagnosed Cancer	Erroneously Diagnosed (Clinically Diagnosed Cancer— Found to be Non-cancer at Autopsy)	Missed Cases (Clinically Diagnosed Non-cancer— Found to be Cancer at Autopsy)	Percentage of Erroneously Diagnosed Cancer	Missed Cases per 100 Erroneously Diagnosed Cancer
Wells ²					
Luharsch ²	400	33	178	8.2	539
Bilz ²	7,426	163	1,312	2.2	805
Ritterhaus ²	600	72	60	12.0	83
Riechelmann ²	405	13	48	9.5	369
de Vries ²	613	58	156	9.3	264
Current Study—Massa- chusetts General Hospital	1,102	102	249		244
	677	57	131	8.4	230

necessary to yield a satisfactory white ash.

THE DIPHENYLTHIOCARBAZONE METHOD FOR LEAD

The precise evaluation of certain of the metals, notably lead, has benefitted greatly within the past few years by the colorimetric diphenylthiocarbazone (dithizone) method of Fischer³ which is extremely sensitive. Useful as it is, it is not specific for lead unfortunately, as a number of other metals give practically identical colors. One must realize, therefore, that in determining lead in a given substance the appearance of the usual cherry color is not necessarily indicative of lead even after the addition of cyanide, and must take account of the possibility of the presence of other metals giving similar colors. Care should be used with respect to the quantity of cyanide used, as it tends to diminish the apparent amount of lead present.

In spite of these difficulties—which are not at all insurmountable—the diphenylthiocarbazone method is extremely valuable for the determination of lead in a great many cases. It is particularly useful for the determination of lead in spray residue on fruit and as developed by Clifford and Wichmann⁴ seems ideal for that purpose. Here the ratio of lead to other metals, or to the total amount of ash itself, is relatively great compared with similar ratios in tissues or excreta.

It would appear that where the diphenylthiocarbazone method has been applied to the examination of excreta for lead, insufficient account has been taken of the other metal constituents. Zinc and tin are normally excreted in far greater amount than lead and unless careful account is taken of the tin in particular, this may well be accounted as lead. Furthermore, Vinson⁵ has recently reported that zinc in the presence of cyanide is definitely an in-

terfering substance in the determination of lead by the diphenylthiocarbazone method.

When it is recalled that the urinary excretion of zinc is in the neighborhood of 1 milligram per day and that of tin at least as much, the determination of a few micrograms of lead in the presence of these substances in urine is obviously a more difficult problem than the determination of relatively much greater amounts of lead in simpler material.

APPLICATION OF SPECTROGRAPHIC METHODS

Recent years have witnessed a pronounced popularization of the spectrograph for analytical purposes and its immense advantages in metallurgical work perhaps more than anything else have drawn many to employ it for determination of the metals in biological materials.

At present no single method apparently is so full of promise for the analytical evaluation of traces of the heavy metals as the spectrographic. Its extreme sensitivity and the ease with which material may be examined, as well as the minute amounts of material needed for examination, are all most attractive features, and it is not surprising therefore that it has been so widely heralded.

It is unfortunate for its use in this field that some accounts of its application to the determination of traces of metals in biological material have been so enthusiastic. In reality there are formidable difficulties that stand in the way of its use for the precise evaluation of these traces of metals in tissues and excreta.

Familiarity with spectrographic procedure leads one to feel that there is no question that careful search for and comprehension of these difficulties of analytical application will lead to their elimination and yield a precise method of the greatest utility. However, the

rapid advance in the use of the spectrograph for the quantitative determination of metals in biological substances has been in the direction of extending its application, rather than in the narrower (and more uninteresting) field of tracing its difficulties of application.

The mechanical difficulties of quantitative spectrography—whether with reference to the production of the spectrogram, or to the measurement of line intensity—can obviously be met and satisfactorily eliminated as a result of care and experience. The difficulties to which I particularly refer are those of quantitative interpretation and the latter are not so dependent upon measurement of line intensity; whether by the “internal standard” method or by its photometric refinement, the rotating logarithmic sector method, as upon conditions prevailing within the arc and upon other substances present with the metal sought. While the latter condition is of no great significance so far as qualitative spectrography is concerned, it is very important in its quantitative application. The line intensity for a given arc and exposure is not constant during the whole time of arcing, but depends upon the relative rate of distillation of its constituents. Thus, the time required for the line spectra of an element to appear and the length of time it will remain after starting the arc depend upon how quickly it volatilizes. Bauer⁶ found in the determination of lanthanum in the presence of large amounts of calcium that the lanthanum spectrum reached its full intensity at the end of 2 minutes after most of the calcium had already volatilized.

Aside from quantitative variation in the spectrum with time, it is very important to know exactly what part of the arc is focused upon. Mannkopff and Peters⁷ found that such elements as lead, silicon, bismuth, tin, and

others show a line intensity in the cathode layer frequently as much as 100 times that in the gas column of the arc. Certain lines may be very intense near the cathode and yet vanish completely in the arc column.

It is particularly important with respect to biological material to recall that the type of lines emitted and their intensities are affected by the presence of an easily ionizable substance, such as sodium chloride, in the arc.

This makes more or less imperative the use of a medium similar in composition to that of the substance under test, but of course spectrographically free from traces of the metal being evaluated—not at all an easy task.

Webb^{8,9} and also Willey¹⁰ have pointed out that in the graphite electrode impurities, the strongest lines of which can only be faintly discerned in the “blank” spectrum, may leap into prominence as soon as *any* mixture that approximately resembles a tissue ash is introduced into the arc. King¹¹ pointed out that the presence of easily ionizable substances influence the apparent line intensity—notably in the case of calcium. Papish and O’Leary¹² have found that the least recognizable quantity of chromium when introduced into the arc as chromic acid was 0.001 mg., but the same element in fused alumina produced a spectrum much more intense and was recognizable to the extent of 0.00006 mg. Our work with the spectrographic determination of urinary lead so far has been in the direction of tracing such spectral vagaries. With all the sodium, potassium, calcium, and magnesium present in urine ash it is not surprising that more lead is apparently found than actually exists. Papish¹³ has coined the term “pulsion” to designate the variation in intensity of spectral lines as conditioned by ionization phenomena. These facts lead Webb (*loc. cit.*) to state that the tissue distribution of

certain elements found by workers who employed carbon or graphite electrodes must be treated with reserve.

It does not seem that these problems are at all beyond solution. On the contrary, it would appear that, while further careful study of electrode conditions is necessary, quantitative spectrography with respect to the heavy metals in biological material can become more definitely a precision method.

In thus reviewing certain phases of analytical procedure which need further careful investigation, I have not wished to magnify the difficulties of approach, nor to minimize what has been accomplished so far. One cannot but feel confident however that the advances made in industrial hygiene will justify all the care and attention that is devoted to insure precision of measurement.

REFERENCES

1. Eastman, E. D., and Duschak, L. H. The Vapor Pressure of Lead Chloride. Bureau of Mines, *Tech. Paper* 225, 1919.
2. Kahane, E. Destruction de quantités importantes de matières organiques au moyen de l'acide perchlorique. *Bull. Soc. chim. biol.*, 14:294, 1932.
3. Fischer, Hellmut. Die Metalverbindungen des Diphenylthiocarbazon und ihre Verwendbarkeit für die chemische Analyse. *Wiss. Veröffentlich. a.d. Siemens-Konzern*, 4:158-170, 1925.
4. Clifford, P. A., and Wichmann, H. J. Dithione Methods for the Determination of Lead. *J. Assoc. Off. Agri. Chem.*, Feb., 1936.
5. Vinson, C. G. Spray Residue Work in Missouri. Missouri Agri. Exper. Sta., *Bull.* 382, 1937, 15 pp.
6. Bauer, Herbert. Quantitative Spektralanalyse schwer verdampfbarer Stoffe im Lichtbogen untersucht am Lanthanoxyd. *Ztschr. Anorg. Chem.*, 221: 209, 1935.
7. Mannkopf, R., and Peters, C. Über quantitative Spektralanalyse mit Hilfe der negativen Glimmschicht im Lichtbogen. *Ztschr. f. Physik*, 70:444, 1931.
8. Webb, David A. Latent Impurities in Electrodes Used for Spectrographic Research. *Nature*, 139:248, 1937.
9. Webb, D. A., and Fearon, W. R. Studies on the Ultimate Composition of Biological Material. 1. Aims, Scope and Methods. *Sci. Proc., Roy Dublin Soc.*, 21:487, 1937.
10. Willey, E. J. B. Sources of Inaccuracies in Spectrographic Research. *Nature*, 139 758, 1937.
11. King, A. S. Electric Furnace Experiments Involving Ionization Phenomena. *Astrophysical J.*, 55:380, 1922.
12. Papish, J., and O'Leary, W. J. Arc Spectrographic Estimation of Chromium in Ruby. *J. Indust. & Eng. Chem., Anal. Ed.*, 5:11, 1931.
13. O'Leary, W. J., and Papish, J. Analytical Reactions of Rubidium and Caesium. *J. Indust. & Eng. Chem., Anal. Ed.*, 6:107, 1934.

Formate Ricinoleate and Brilliant Green Bile Broths to Detect Coliform Organisms in Pasteurized Milk*

I. C. GUNSALUS AND C. N. STARK

Laboratory of Bacteriology, Cornell University, Ithaca, N. Y.

THE results of most recent studies reported (Swenarton, 1927; McCrady and Langevin, 1932; Stark and Patterson, 1936; and others) indicate that although members of the coliform group of bacteria may occasionally resist the heat treatment employed in the pasteurization of milk, organisms of this group which can survive the pasteurization process are seldom observed. Exhaustive studies made by the New York State Department of Health, as well as those made by other workers, have indicated that coliform organisms were present in approximately 1 per cent of pasteurized milks known to contain these bacteria previous to the heat treatment.

Although bacteria belonging to this group are occasionally found to be able to resist the heat treatment of the pasteurizing process, their presence in pasteurized milk is usually interpreted to indicate recontamination. One of the principal reasons for testing pasteurized milk for the presence of coliform bacteria is the ease with which the test can be made. Although it is well known that bacteria belonging to the *Escherichia-Aerobacter* group are

not, as a rule, disease producers and that their presence in milk does not have the same sanitary or public health significance as does their presence in drinking water for human consumption, the seriousness of permitting pasteurized milk to become recontaminated with any kind of bacteria is readily recognized.

At present either the amylase or phosphatase test is employed to ascertain whether milk has been properly pasteurized, and tests to determine the presence or absence of coliform organisms are used to guard against the recontamination of properly pasteurized milk.

The significance of the presence of small numbers of coliform organisms in raw milk is unknown. All who have tested the various media which have been suggested for use on milk readily recognize that these media do not give as satisfactory results on raw milk as they give on pasteurized milk. Because of this, and since we have no accepted standards for the significance of coliform organisms in raw milk, workers making comparative media studies would do well to use pasteurized milks.

No perfect medium has been or probably will ever be found. It has been shown (Stark and Curtis, 1936) that brilliant green 2 per cent bile

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

TABLE I

Formate-Ricinoleate Broth as a Presumptive Test Medium for the Detection of Escherichia-Aerobacter Organisms in Pasteurized Milk

Series	Date of Test	No. of Samples Tested	No. Positive	No. Confirmed	Per cent of Samples Positive	Per cent of Samples Confirmed	Per cent of Positives Confirmed
I	4/24/36	229	35	34	15.3	14.9	97.0
II	7/23/36	221	69	68	31.2	30.8	98.5
IV	4/ 1/37	205	43	42	21.0	20.5	97.6
Total or Average		655	147	144	22.4	22.0	98.0

broth will permit gas production by certain spore-producing bacteria not known to have sanitary or public health significance in pasteurized milk. How frequently these false test organisms will be encountered in pasteurized milk is not definitely known. Some have criticised the toxicity of formate ricinoleate broth. Bacteria capable of causing false tests in this medium may be found.

Using formate ricinoleate broth as the test medium for the detection of coliform organisms in 655 samples of pasteurized milk, 147 were found to be positive (Table I); only 3 samples, about 2 per cent of the positives, failed to confirm. In this study special effort was exerted to confirm all samples giving positive presumptive results. Before criticising too severely any medium for failure to confirm, one must recognize that failure to confirm does not necessarily prove the positive presumptive test to be false. The isolation of bacteria capable of producing the false test is strong evidence. In this study formate ricinoleate broth con-

firmed in 98 per cent of the cases; in the other 2 per cent (3 samples), slow lactose fermenting coliform organisms were found in 2, and in the other sample non-lactose fermenting bacteria, which might belong to the Salmonella group, or might be Escherichia organisms which had lost their ability to ferment lactose. The detection of weak lactose fermenting strains should be an advantage rather than a drawback for this medium. It is believed by us that pasteurized milk containing Salmonella organisms should be considered unfit for consumption and that a medium which detects these bacteria comes one step nearer to the ideal medium. From these data it is concluded that the presence of organisms in pasteurized milk which are able to cause false presumptive tests in formate-ricinoleate broth are rare. It is realized, however, that false presumptive tests might at times be encountered.

In a comparative study of 221 samples of pasteurized milk (Table II), brilliant green 2 per cent bile broth gave a slightly greater number of positive

TABLE II

Comparison of Presumptive Test Media for Detection of Escherichia-Aerobacter Organisms in Pasteurized Milk

221 Samples Tested 7/23/36

Media	No. of Samples Positive	No. of Samples Confirmed	Per cent of Samples Positive	Per cent of Samples Confirmed	Per cent of Positives Confirmed
Brilliant Green 2 per cent Bile	76	73	34.4	33.0	96.0
Formate-Ricinoleate	69	68	31.2	30.8	98.5

presumptive tests than did formate ricinoleate broth, but the brilliant green bile broth gave a slightly lower percentage confirmation; in certain instances the gas in the positive presumptive tubes was shown to have been produced by anaerobic spore-producing rods.

SUMMARY

Formate ricinoleate broth has been used to determine the presence of coliform organisms in 655 samples of pasteurized milk. Ninety-eight per cent of the positive presumptive tests confirmed; in the other 2 per cent, 3 samples, slow lactose fermenting or related organisms were found.

In comparative tests on 221 samples

of pasteurized milk formate ricinoleate and brilliant green 2 per cent bile broth gave approximately the same number of positive presumptive tests. Brilliant green gave a slightly higher yield of positive presumptives, but some of these were shown to be due to anaerobic spore-producing rods.

REFERENCES

- McCrady, M. H., and Langevin, E. M. The *Coli-Aerogenes* Determination in Pasteurization Control. *J. Dairy Sci.*, 15:321-329, 1932.
- Stark, C. N., and Curtis, L. R. Evaluation of Certain Media for the Detection of Colon Organisms in Milk. *A.J.P.H.*, 26, 4:354-356, 1936.
- Stark, C. N., and Patterson, M. C. The Heat Resistance of Colon Organisms in Milk. *Abstr., J. Dairy Sci.*, 19:495, 1936.
- Svenarton, J. C. Can *B. coli* be Used as Index of Proper Pasteurization of Milk? *J. Bact.*, 13: 419-429, 1927.

New Jersey Health Legislation

WE are indebted to *Health Progress*, the publication of the New Jersey Health and Sanitary Association, for the following summary of important developments in public health legislation in New Jersey:

A marriage bill, which was drafted by the venereal disease committee of the Health and Sanitary Association and sponsored by the State Department of Health, provides that, beginning July 1, 1938, each applicant for a marriage license in New Jersey must present a certificate from a qualified physician stating that a standard laboratory blood test for syphilis has been made and that, in the opinion of the physician, the person either is not infected with syphilis or is not in a stage of that disease which may become communicable.

Another law, effective January 1, 1939, requires physicians to take blood samples for syphilis tests from all expectant mothers at the time of the first examination. Midwives and others are not allowed to take such samples but must call in a physician for the purpose. All birth certificates must include a statement as to whether or not the blood test was made and the date.

Another provision, which is now in effect, provides \$25,000 for the purchase and distribution of pneumonia serum by the State Department of Health.

A fourth provision allows local boards of health to pool their finances for the purpose of lifting the levels of their work and permitting small communities which cannot afford full-time service to employ qualified personnel.

Politics in the Selection of Health Department Personnel

Is There a Remedy?*

WILLIAM PARR CAPES

*Executive Secretary, New York State Conference of Mayors
and Other Municipal Officials, Albany, N. Y.*

BEFORE the question assigned to me can be discussed intelligently, we must know exactly what we are discussing. The use of the word "politics" is bothersome and, unless we determine its exact meaning and application for this discussion, our suggestions may be misinterpreted and therefore misleading. If we define politics as the science of government, which is one dictionary definition, there can be no objection to its use in the selection of health department personnel. If, however, we consider politics as the subservience of the interests of a political party or of interests other than public, which is the most prevalent interpretation, then we have a problem which demands our most serious thought.

Pernicious politics, no matter by whom used, can degrade the personnel of any municipal department. We must not forget, however, that we have several kinds of politics, all of which are equally harmful to efficient public service. Most of us think only of partisan politics, because we hear more about party activities than those of

other groups. In addition we have, for example, personal politics, fraternal politics, racial politics, religious politics, and the politics of professions. Political parties are not the only ones which "play" politics in its reprehensible sense. We have civic organizations, cliques, and professional bodies which do not hesitate to place their selfish interests above those of the public. We have school politics, labor politics, bank politics, insurance politics, and even health politics.

In order that there may be no misunderstanding, I shall assume that the question under discussion is this: What can be done, if anything, to prevent any interests other than public interfering in the selection and retention of efficient health department personnel?

First, qualification for persons eligible for health department service should be prescribed, either by state law or by a state body. Experience in New York State has demonstrated that it is preferable to establish qualifications by a state body. It is exceedingly difficult, if not almost impossible, to prescribe by law satisfactory qualifications which meet all conditions over a period of time. For several years the Public Health Council of New York State has had authority to prescribe by regulation

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

the qualification for local health officers or commissioners and public health nurses. A law was enacted at the last session of the Legislature giving to the Council power also to determine the qualifications for dairy and milk inspectors, operators of public sewage treatment plants and public water treatment and purification plants. If such a state body performs its duties efficiently and does not use its power to create a monopoly in the health field or to favor individuals or groups, and the state department uniformly and rigidly enforces the regulations, this state activity will guarantee a minimum of knowledge and experience which every appointee must have. Political or other interests cannot break through this barrier. The success of this plan depends upon the reasonableness of the regulations and their impartial enforcement. With such a plan in effect the number of applicants is reduced to those who have the knowledge and experience to perform their duties properly. Under it no political or other interest can demand, for instance, that a bartender out of a job be appointed milk inspector or the operator of a sewage disposal plant.

But this alone is not enough. Proficiency among those who are able to meet the prescribed qualifications is not uniform. Therefore, if we are seeking the best, we must put into operation some plan which will make it possible for the appointing officer to select the most proficient of those qualified. No better plan for doing this has yet been devised than civil service. I know the drawbacks and weak points of civil service, but I am convinced that these can be eliminated by proper laws and good administration. If local civil service commissions are effectively supervised and aided by an efficient state commission, and if the local body coöperates with the appointing officer in an effort to make available by ap-

pointment only the best qualified persons, then the opportunity for favoritism and the establishment of mediocre eligible lists are reduced to a minimum.

Much of the criticism of local civil service commissions can be eliminated by the adoption of two comparatively simple plans.

First, the prevalent inability of local commissions to prepare proper examinations for technical positions, such as those in health departments, and to rate papers properly can be remedied by the establishment in the State Civil Service Department of a municipal advisory bureau. The staff of such a bureau could have available technical experts to assist local commissions in preparing proper examinations, and both the staff and experts could aid in rating the papers.

Second, local commissions should assist the local appointing officer in every way possible in obtaining the services of the kind of person he feels he needs to fill the position. This can be done by the local commission conferring with the appointing official when a request is made for the establishment of an eligible list, and learning what qualifications are essential for the job. In performing this duty the local commission should be careful to impress upon the appointing official that it does not want to know what person he desires to fill the position, but what kind of a person is necessary.

The efficient administration of a proper civil service law not only will help health departments to obtain good officials, but also to retain them. A proper statute impartially administered insures tenure of office during good behavior and satisfactory service. However, legislators are being constantly importuned by various groups of civil service employees to build a bomb proof wall around them so that it is almost impossible to remove them

except for some very grave offense. As a result, dry rot enters into the service and the incentive for meritorious service is destroyed. Health department heads must join with other administrative officials in constantly and vigorously opposing such legislation.

The third suggestion I have to offer relates entirely to the retention of an efficient health department personnel. This is just as important as the selection. A department which can retain an efficient personnel will have fewer selections to make. A health officer, food inspector, water superintendent, or any other official in a health department may have all of the preëntry qualifications prescribed. He may also be the best equipped by knowledge and experience as shown by his civil service rating. However, as he continues in the service, he is liable to retrogress or become infested with the termites of indifference unless he keeps abreast of the times by constant study. Experience has demonstrated that in-service and extension training services are the most effective ways to keep officials alert, progressive, and skillful.

A study and observation of municipal administration in New York State revealed a few years ago that the goal of perfection sought was not being approached as rapidly as the public demanded and the officials desired. It was found that municipal servants were not uniformly proficient, and that practically nothing had been done to help the new official know his job. Experience alone had been teaching the official the daily routine of public service, and although experience was a competent and exacting teacher, it was also slow and expensive. The problem was solved by the gradual establishment by the New York State Conference of Mayors and Other Municipal Officials of training schools for officials in service. Following the successful demonstration between 1928 and 1935, the

University of the State of New York granted to the officers of the Conference of Mayors a charter incorporating the Municipal Training Institute of New York State as an educational institution to operate the municipal training schools. We now have in New York State the equivalent of a municipal university offering 20 courses of practical and systematic instruction in municipal government to 15,000 employees. We have to date operated more than 300 training schools which have been attended by more than 47,000 municipal officials. Among these schools are one for each of the following groups of health officials: milk and dairy inspectors, water superintendents and plant operators, sewage disposal plant operators, and food inspectors.

To supplement the training the officials receive in these training schools, we are now developing in New York State an extension training course for each group. The foundation of this course is a monthly information bulletin. The material for these bulletins is supplied by the local departments and consists of articles describing any new plans or changes in plans, or policies, new developments in work, changes in organization or financing work and new problems, ideas and theories. In effect, the staffs of all the departments in the state have a monthly round table by correspondence at which they present and discuss their work and developments during the previous month. The schools teach the attending official the fundamentals of his job; the extension courses keep him informed of new developments in his work between school sessions.

These schools and extension courses have reduced the costly apprenticeship period of public officials, decreased municipal administration expenses, and are lessening public dissatisfaction with municipal services. They have raised the standard of municipal service,

lengthened the tenure of office, reduced personnel turnover, increased the efficiency of officials and employees, and are gradually convincing the public, including the various interests mentioned in the beginning, that municipal service is not just a political job, but a technical and highly specialized work.

A program of qualification, examination, and training is in my opinion the best so far devised to prevent political or other interests than public interfering in the selection and retention of efficient health department personnel. It is not spectacular, but it is practical. The program as a whole is unusual. I

know of no state or municipality which has in operation all of the recommendations. Several governmental units have adopted one or two of the suggestions and have demonstrated their practicability and value. Few of these, however, can boast of such efficient administration as is necessary to produce desired results.

The program carries with it no guarantee of perfection. It provides the machinery by the operation of which the results sought may be obtained. The more proficiently the machine is operated, the better and more permanent will be the personnel.

Whooping Cough Most Intractable of Childhood Diseases

AT the beginning of the Twentieth Century every one of the 4 principal communicable diseases of childhood (measles, scarlet fever, whooping cough, and diphtheria) was an important cause of death, whereas, at the present time, each is a minor cause. Diphtheria, in the 5 year period 1900-1904, so far outranked the 3 others that it caused more deaths than did all 3 combined. With a death rate in excess of 40 per 100,000 population, in the year 1900, this disease just escaped inclusion among the 10 leading causes of death in the country.*

With the passing of more than one-

third of the century, however, the picture has changed. Not only have the death rates from these diseases been materially reduced, but there has also been a change in their relative rank. Whooping cough is now the leader and takes a toll of 3 lives to every 2 charged to diphtheria.

The following table shows the death rates from each of these diseases for the 5 year periods 1931 to 1935 and 1900 to 1904.

*Average Death Rates per 100,000 for the Principal Communicable Diseases of Children
Original Registration States
1931-1935 and 1900-1904*

Cause of Death	1931 to 1935	1900 to 1904
Measles	2.0	10.0
Scarlet fever	2.1	11.8
Whooping cough	2.9	10.7
Diphtheria	2.0	32.8

* In an area consisting of 10 states and the District of Columbia. Reliable data on the mortality from individual causes of death are not available for the rest of the United States for the year 1900.

—*Stat. Bull.*, Metropolitan Life Insurance Company, Apr., 1938.

A Sanitary Study of Commercial Laundry Practices*

LLOYD ARNOLD, M.D., F.A.P.H.A.

Department of Bacteriology and Public Health, University of Illinois College of Medicine, Chicago, Ill.

WE have applied our knowledge of sanitary sciences to restricting the distribution of bacteria in water, milk, and food. The present paper is a report of a year's study of the sanitary practices in 54 laundries. The purpose of the study was to ascertain the usual practice and then to develop methods of procedures to overcome the sanitary errors, if such existed.

The washing formula can be subdivided into two large groups, one using a high temperature for white clothes and fabrics, the other requiring a low temperature formula to preserve the color of textiles which would be altered by high temperature. Any washing formula must prevent loss of tensile strength, and the whiteness retention must be preserved. Fabrics must not lose more than 10 per cent of their tensile strength after 20 complete washings, and the whiteness retention tests cannot show more than 6 per cent loss. The formula studied by us conformed to these tests. We were concerned only with the bacterial counts of the wash waters and the textiles in the laundry process.

A family's weekly laundry bundle is subdivided into approximately 16 classifications. Each classification receives a different treatment. Space does not allow us to go farther into this aspect of the washing technic, but for the purposes of this report we shall for convenience and simplicity consider but 2 of these formulae: the high temperature white clothes and the low temperature colored clothes formulae.

Tables I and II give the high and low temperature washing formulae. The flush is the wetting process and consists of the addition of water. This is followed by 4 suds. The washing apparatus is drained after each operation. The 4 rinsing processes are to remove the detergents used in the washing process. The last or sour rinse is to remove the residual soaps which may be retained in the clothes. The whole procedure consists of 4 detergency operations for cleansing the clothes and a similar number of rinsing operations to remove the detergent.

Tables I and II also give the purpose of each operation, the holding time, temperature, and the average bacterial count per c.c. of the wash water. The bacterial count is based upon a year's study of 2 laundries, each was tested twice weekly throughout the year.

The high temperature washing proc-

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

TABLE I
High Temperature Washing Formula
White Clothes

Operation	Purpose	Temperature Degrees Fahrenheit	Holding Time Minutes	Average Bacterial Count per c.c. Wash Water (1 Year— 120 Experiments)
Flush	Wets cloth (removes surface soil)	110	5	200,428
1 Sud	Detergent—(soap-alkali)	125	10	94,314
2 Sud	" " "	135	10	42,518
3 Sud	" " "	140	10	8,382
4 Sud	" " " plus 1% Bleach	165-170	15	5
1 Rinse	Removes detergent	165	3	1
2 Rinse	" "	165	3	0.5
3 Rinse	" "	165	3	0.4
4 Rinse	" "	165	3	0.2
After Sour Blue	Removes residue detergent	140 } 110 }	10	Sterile

ess does not present many sanitary problems. A temperature of 165° to 175° F. with a chlorine (bleach) concentration of 0.01 per cent in the fourth suds, held for 15 minutes is an effective germicidal process. This temperature prevents accumulation of bacteria inside the washing apparatus. Any deposit of insoluble material does not contain living bacteria. Approximately 75 to 80 per cent of the total wash in laundries is processed by this high temperature method.

The low temperature washing formula presents some interesting sanitary problems. The preservation of the fabrics, silks, woolens, and the colors

necessitates a low temperature washing procedure, too low to be of significance as a bactericidal procedure. Dilution by repeated washing and rinsing is the principal mechanism of removal of bacteria from the clothes. The last operation used by laundries consists of the addition of some sour or weak acid to remove the residual detergent and brighten the colors of the clothes. We have found that this operation can be used as a bactericidal process. If the sour used brings the hydrogen-ion concentration down to pH 3.8 to 4.2 and is held for 5 minutes, there is a reduction of the bacterial count. We have therefore utilized this common

TABLE II
Low Temperature Washing Formulae
Light Colored Clothes
Light Colored Clothes—Finished Service
Dark Colored Clothes

Operation	Purpose	Temperature Degrees Fahrenheit	Holding Time Minutes	Average Bacterial Count per c.c. Wash Water (1 Year— 120 Experiments)
Flush	Wets cloth (removes surface soil)	90-100	5	3,674,055
1 Sud	Detergent (soap-alkali)	100	10	1,979,862
2 Sud	" " "	100	10	1,248,758
3 Sud	" " "	100	10	255,579
4 Sud	" " "	100	10	221,293
1 Rinse	Removes detergent	100	3	88,966
2 Rinse	" "	100	3	67,461
3 Rinse	" "	100	3	43,809
4 Rinse	" "	100	3	35,278
5 Rinse	" "	100	3	24,441
After Sour	Removes residue detergent—brightens colors	95	5	158

procedure and adapted it so as to make a germicidal agent. This requires a carefully controlled operation; the colorimetric determination of the hydrogen-ion concentration must be carried out on each load of clothes washed.

The following sourings have been studied:

Sodium Acid Fluoride
Sodium Silico Fluoride
Ammonium Acid Fluoride
Ammonium Silico Fluoride
Acetic Acid

Table III gives the average amount of each sour to be added per lb. of clothes in order to obtain the required hydrogen-ion concentration. The buffered sourings are safer and more satisfactory. The organic acids can be added in excess and will then reduce the tensile strength of the textiles in the wash.

TABLE III

One and One-half Grams of Each of the Following Sourings Were Added per lb. of Clothes—Hydrogen-ion Concentration and Bacterial Count Determined at 5 Minutes' Holding Time

	pH	Bacteria per c.c.
Sodium Acid Fluoride	4.3	40
Sodium Silico Fluoride	4.4	127
Ammonium Acid Fluoride	4.2	12
Ammonium Silico Fluoride	4.4	101
Acetic Acid	5.0	280

teria. Space does not permit a detailed discussion of methods of determining the degree of bacterial seeding of cylinders. Table IV gives the aver-

TABLE IV

Examples of Average Bacterial Count per Square Inch of Surface of Dirty and Clean Cylinders

Laundry	Before Cleaning	After Cleaning
A	529,740	18
B	2,910,600	25
C	3,559,500	41
D	3,100,750	4
E	2,153,000	36
F	612,550	11

age number of bacteria cultured from wooden cylinders per sq. in. of surface before and after cleaning from 6 laundries. Table V gives a method of cleaning cylinders which we have found to be very effective and practical. Sodium silico fluoride dissociates at high temperature and acts as a solvent for the calcium soap residues as well as a germicidal agent. Twenty minutes holding time at 190° to 195° F. in the presence of this acidity destroys the bacterial flora in deposits. Rinsing at high temperature, followed by the use of caustic soda to neutralize the acids in the wooden cylinders, followed again by hot rinses, leads to a clean cylinder with a very low bacterial count on its surface.

TABLE V

A Method for Cleaning Wooden Cylinders in Laundries

Procedure	Purpose	Time Minutes	Temperature Degrees Fahrenheit
2 lb. Sodium Silico Fluoride	Acid to dissolve insoluble soap residue and kill bacteria	20	190-195
Hot Rinse	Remove residual acid and destroy bacteria	5	170
Hot Rinse	Remove residual acid and destroy bacteria	5	170
2 lb. NaOH	Neutralize acidity and remove residue	20	190-195
Hot Rinse	Kill remaining bacteria and remove residual chemicals	5	170
Hot Rinse	Kill remaining bacteria and remove residual chemicals	5	170

The low temperature washing formula allows insoluble residues to be built up on the inside of the machines. The cylinders become coated with insoluble calcium soaps and other materials which harbor many living bac-

Table VI gives the results of bacterial counts of the last souring rinse from 3 laundries using the same washing formula before and after the cylinders were cleaned. Table VII records an average low temperature

TABLE VI

*Bacterial Count per c.c. of Rinse Water
Before and After Cleaning of
Wooden Wash Cylinder*

Laundry	<i>After Sour Rinse</i>	
	<i>Before Cleaning</i>	<i>After Cleaning</i>
A	160	35
B	2,080	23
C	13,860	40

dirty cylinder wash. It is self evident that bacteria are being added from some source to the wash waters. The 4th and 5th rinse waters contain more than twice the number of bacteria that were present in the 3rd rinsing operation. The souring process was not effective because of the inexhaustible bacterial reservoir on the surface of

TABLE VII

*Influence of Clean Cylinders upon the Sanitary Efficiency of Low Temperature
Washing Formula*

<i>Bacterial Count per sq. in. of Cylinder Before Cleaning</i>	<i>Bacterial Count of Wash Water per c.c. Before Cleaning</i>		<i>Bacterial Count per sq. in. of Cylinder After Cleaning</i>	<i>Bacterial Count of Wash Water per c.c. After Cleaning</i>	
2,910,600	Flush	378,000	25	Flush	300,590
	1 Sud	262,080		1 Sud	252,000
	2 Sud	270,900		2 Sud	49,330
	3 Sud	126,000		3 Sud	47,500
	4 Sud	136,000		4 Sud	45,100
	1 Rinse	133,100		1 Rinse	43,100
	2 Rinse	14,490		2 Rinse	13,600
	3 Rinse	11,530		3 Rinse	9,900
	4 Rinse	26,200		4 Rinse	4,820
	5 Rinse	24,300		5 Rinse	4,410
	After Sour	2,080		After Sour	23

washing process with bacterial counts per c.c. of the wash water, using the same machine before and after cleaning of the cylinder. It is apparent that the sanitary efficiency of the process is not satisfactory when the cylinder acts as a bacterial reservoir during the procedure. We wish to call attention to the irregularity of the counts in the

the cylinder in contact with the clothes.

There is a seasonal variation in the bacterial counts of clothes received by laundries. During the warm months the bacterial flora of clothes is much higher than during cold months of the year. Table VIII gives the summary of a year's cycle by months in one laundry studied.

TABLE VIII

Laundry B

Light Colored Clothes

Average Monthly Flush

Last Rinse and After Sour

Bacterial Counts per c.c. for 1 Year

	<i>Flush</i>	<i>Last Rinse</i>	<i>After Sour</i>	<i>Maximum Temperature</i>
January	885,750	19,850	76	46° F.
February	322,925	17,484	37	42° F.
March	349,465	9,236	92	47° F.
April	744,480	13,248	112	66° F.
May	2,876,487	51,504	224	77° F.
June	4,498,500	20,331	361	84° F.
July	14,063,111	27,149	427	88° F.
August	18,514,530	27,122	430	95° F.
September	16,288,870	36,378	426	91° F.
October	2,055,090	55,188	388	72° F.
November	1,203,697	16,050	216	56° F.
December	850,045	19,646	119	48° F.

Staphylococcus albus is the predominant bacterium in the flora in all wash waters from flush to the after sour rinse. This is the microorganism that increases in the clothes during the warm weather months of the year. The flora in the after sour rinse are usually large china white colonies of *Staphylococcus albus*.

A part of this high count after the souring operation was due to dirty cylinders. This is shown in Table IX. If the low temperature washing formula is used several times each day a wooden cylinder will build up a surface deposit in 4 to 6 weeks that will materially influence the sanitary quality of the washing process. We have found that if a cylinder is cleaned properly, and then once a week this cylinder is used for high temperature washes, it will perform in a sanitary manner for at least 6 weeks before it will show by both surface swab and rinse water high bacterial counts. If the clean cylinder is used on alternating days for high and low temperature washes, it will remain clean for several months.

TABLE IX

Influence of Clean Cylinders on the Average Monthly Bacterial Count During Summer Months

Low Temperature Washing Formula

	July, 1937	August, 1937
Cylinders cleaned:	May 1, 1937	August 1, 1937
Flush	14,063,111	4,536,962
Last Rinse	27,149	27,122
Sour Rinse	427	218
Maximum Monthly Temperature	88° F.	95° F.

Table X gives a résumé of a series of experiments to determine the relationship between the bacterial counts in the water and the bacteria on the clothes. We are more interested in the bacteria remaining on the wearing apparel than in those in the wash waters. Test clothes were put into the wash clothes and removed after

TABLE X
Relationship Between Distribution of Bacteria in Wash Waters and Fabrics
Average of 54 Experiments
Fast Colored Clothes Low Temperature Washing Formula

	Total Bacterial Count per c.c. of Wash Water	Total Bacterial Count per sq. in. of Cloth
Flush	3,201,950	3,776
First Suds	1,025,333	813
First Rinse	84,870	201
Last Rinse	16,263	84
After Sour Rinse	201	36
Extractor		
Immediately	345	33
3 Minutes	28	10
9 Minutes	19	4
After Ironing		0

various operations. Five square inches were cut out under aseptic precautions and bacterial counts made on each sq. in. sample. The technic was to suspend the inch square sample in 10 c.c. sterile saline and shake in a machine for 10 minutes. One, 2, and 4 c.c. samples were used for shake plate counts and the inch square fabric was transferred to a sterile Petri dish and covered with melted cooled nutrient agar. The bacterial count was calculated and the last column represents averages of these experiments. Bacteria are removed from the clothes during the washing process as would be expected from the wash water count. The extraction operation (centrifugation) removes the excess water and we found this process was very effective in removing bacteria. The extraction operation lasts 10 minutes. The remaining bacteria are destroyed by ironing.

We have conducted numerous ironing experiments. We have substantiated previously published reports from other sources that the high moist temperature is an effective process in killing bacteria, vegetative forms as well as spores. We have added bacteria (*B. subtilis*, *B. welchii*, *B. megatherium*, *Staphylococcus*, *Streptococcus*, *B. coli* and *B. pyocyaneus*) to

fabrics in high concentrations before passing through the ironing machines. All fabrics—using 12 inch square pieces submerged in broth flasks—were sterile after ironing.

We do not feel that the demonstrated efficiency of the ideal ironing process should be depended upon to remove large numbers of bacteria from clothes. This is similar to expecting pasteurization to make dirty milk wholesome for human consumption.

SUMMARY

The high temperature washing formula used for white clothes and fab-

rics has sufficient temperature and holding time to insure a safe procedure from a public health standpoint.

The low temperature washing formula used for other classifications requires more attention. The cylinders or machines need frequent cleaning to prevent bacterial accumulation on their surfaces. The souring operation must be carried out at a hydrogen-ion concentration of between pH 3.8 and 4.2 to insure low bacterial counts.

The extraction and ironing procedures remove or kill the residual adherent bacteria in all instances studied by us.

Supervision of Food in New York City*

A. LICHTERMAN, PHAR.D.

*Acting Director, Bureau of Food and Drugs, Department of Health,
New York, N. Y.*

IN anticipating the supervision of food in New York City, one must familiarize himself with the quantity and type of food which is received daily; the geographic confines of the city, and the points of entry. At the outset, consider a train of railroad cars, each loaded with food containing approximately 20 tons. A train of this sort which is 2 miles long, or the equivalent of 200 city blocks, would represent the approximate food bill per day for the City of New York. There is about 28,578,425 lb. of food consumed daily in New York City.

New York City comprises an area of approximately 319 square miles, with a population of 7,294,000 persons and 1,000,000 commuters and daily visitors. There are about 120,000 food establishments of all kinds, of which 25,000 are wholesale or manufacturing plants. There are 733 piers within the borders of this city where 327 ocean liners dock weekly from all parts of the world.

The milk supply for New York City is received daily from a milk shed which comprises 7 states and is within a radius of 500 miles of New York City. To furnish this milk supply, there are 62,286 establishments outside of New York City and 475 estab-

lishments within the city and the metropolitan area.

To have some control over this vast food supply, it is essential that a detailed knowledge of the points of entry of food be part of the equipment of the Administrator. He must be able to dispatch inspectors on short notice to all these points, in order to keep unwholesome or questionable food from entering the food channels. This procedure is more exemplified by the activity of the Bureau of Food and Drugs during the early part of 1936 when we were concerned with keeping condemned food from the flooded areas from entering our city. Due to precautions taken, four cars holding 80,000 lb. of semolina flour, one car holding 20,000 lb. of butter, and large quantities of meat were seized and condemned before they were able to enter food channels.

It is essential in the supervision of a food supply to know the geography of the city, especially the market areas and districts where large quantities are handled and stored. With such information on hand, it is relatively simple to conduct periodic surveys of these establishments in the given areas.

METHODS OF CONTROL

Control of all food establishments of the City of New York rests with the Bureau of Food and Drugs, of the Department of Health. The method whereby control of these food estab-

* Abstract of paper read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

TABLE I
Special Surveys of Different Foods and Plants

Character of Survey	Time of the Year When Survey Is Made											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1. Milk	x	x	x	x	x	x	x	x	x	x	x	x
2. Ice cream		x	x	x	x	x	x	x	x			
3. Carbonated waters			x	x	x	x	x	x	x			
4. Syrup factories			x	x	x	x	x	x	x			
5. Egg breaking establishments			x	x	x	x	x	x	x			
6. Summer resorts				x	x	x	x	x	x			
7. Dry storage warehouses	x	x							x	x	x	x
8. Shellfish					x	x	x	x	x			
9. Fish and fillet	x	x	x	x								x
10. Candy factories	x								x	x	x	x
11. Cold storage plants									x	x	x	x
12. Food factories	x									x	x	x
13. Spray residue on fruits and vegetables							x	x	x			
14. Meats and poultry				x							x	x
15. Milk and cream from unapproved sources											x	x

lishments is maintained, consists of dividing the city into inspection districts, each being supervised by an inspector. Major control work is carried on through seasonal activity and planned projects. Table I indicates the time of the year when special surveys are undertaken of the different foods and food manufacturing plants.

In addition to the activity of the Bureau of Food and Drugs in connection with seasonable activities and planned projects, inspectors of this bureau are required to make routine inspections of establishments under permit to conduct restaurants, bakeries, soft drinks, milk, cheese, butter and eggs, shellfish, preserved meats, etc. Also, the investigation of complaints involving food establishments requires the attention of the food inspector. During 1936 more than 12,000 complaints were investigated including every conceivable subject concerning food or sanitation in food establishments. Piers, railroads, terminals, market areas, and places where food enters the city are covered by the inspector of the particular district in which the receiving points are located.

METHODS OF INSPECTION

The essential sanitary conditions to be determined in a food establishment by an inspector are:

1. Adequate toilet facilities with running hot and cold water
2. Adequate refrigeration for perishable foods
3. Clean utensils and adequate sterilization
4. General cleanliness in and about the plant
5. Undue exposure of foods to contamination by dust, dirt and flies
6. Removal of obnoxious odors
7. Hygienic habits of the operators

A good food inspector is able to recognize quickly whether the operator is conducting his business in accordance with the fundamental sanitary laws, or is careless or slipshod in his methods. Merchandise stored in corners or hidden behind boxes involves spoilage and undue waste; cans standing to one side or tipped on shelves indicates swells; unclean labels on cans may indicate leakers or food from salvage stores; sediment in bottled goods serves to indicate improper storage, manufacturing, packing or perhaps spoilage.

Records, dealing with the receiving

and storing of raw products and the distribution thereof, should be examined in all manufacturing plants. Information of this nature often uncovers improper methods and practices on the part of the food processor.

EDUCATION OF THE FOOD DEALER

Dealers in food generally are not acquainted with the health aspects of handling, storing, or manufacturing of foods, nor the reason for the regulations promulgated to control these conditions. A program of education whereby representative food organizations are called to meetings of their respective groups should be inaugurated. At these conferences, officials of the Food and Drug Bureau give detailed information explaining the health significance of the regulations governing the respective industries. Open discussion is held after presentation of the initial talk. Often new ideas are expressed by the industry which are of interest to the health officer and reveal problems in health control.

When the administrative office has secured the confidence of the industry, information concerning questionable practices is often brought to its attention, which leads to corrective measures being taken. The results of such conferences tend toward an understanding for better coöperation between the industry and the health administrator, ultimately benefitting the public at large.

COÖPERATION WITH OTHER HEALTH AGENCIES

Food control administrators must of necessity develop a feeling of confidence in their fellow workers in departments within the city, and other municipal, state, and federal control agencies. The policy of the Bureau of Food and Drugs of the New York City Health Department has been to co-operate and give every assistance to

such agencies. The principal concern is to protect public health. This spirit of coöperation makes the food dealer realize that not only has he the city authorities to contend with but also the other local, state, and federal agencies.

PERSONNEL TRAINING

Besides the general office and field training of the new inspector, provision is made for further instruction once he has obtained the fundamentals of food and sanitary work. The personnel of the Bureau of Food and Drugs has at times taken advantage of courses at New York University, Cornell University, Massachusetts Institute of Technology, and special courses given by the State Department of Agriculture at Albany, N. Y. At present there is one man assigned to a full 1 year course in sanitary and food control at Massachusetts Institute of Technology. In addition, 10 men are assigned to take a similar short course of 8 weeks' duration at New York University. Those who have had the benefit of such courses are required to present papers at Inspectorial Meetings which are held semi-monthly. Free discussion is encouraged and better understanding developed among the personnel regarding the scientific principles of sanitary inspection and food control.

RECORD KEEPING

Records of work accomplished and findings of the inspectors in the course of their daily routine must be kept in order that results may be tabulated and future action planned. An instance in which the benefits obtained from the keeping of proper records was brought out in the methods pertaining to record keeping for food poisoning cases. Prior to the inauguration of the new system the procedure was to total the number of investigations made relative to cases where food was suspected

of causing illness. This total was accepted as the number of food poisoning cases for the current year. The present method involves the classifying of reported cases of alleged food illness into 3 groups. The first group is known as "confirmed" or "proved" food poisoning cases. The second are those which are "doubtful," and the third are those instances which are proved to be "non-food" poisoning cases.

CONCLUSION

The City of New York has a vast supply of foodstuffs coming to its more than 7,000,000 population daily. The responsibility of keeping this food supply available and wholesome at all times rests largely with the Bureau of Food and Drugs of the Department of

Health. Proper control has resulted in not a single epidemic or severe outbreak caused by food for many years.

The modern health officer realizes that a safe food supply means a healthy community; that with a safe food supply it becomes his function, through educational methods, to bring to the attention of the people of his community how to use this food so that they may get the best nutritional value therefrom. Food dealers should be made to realize that the health inspectors' function is to advise and teach them the proper manner in which to conduct their food establishments. This cooperation between the dealer and the department of health leads to a safe food supply.

The Nutritionist in a City Public Health Program*

SOPHIA S. HALSTED

Nutrition Director, Department of Health, Detroit, Mich.

DETROIT became interested in nutrition about 1921 when the whole nation was concerned with improving the physical conditions revealed by examinations for military service during the World War. If improvement was to be shown in the rising generation, malnutrition was one of the enemies which must be conquered. It seemed quite logical to begin with the school children of the city, and consequently a plan modeled after the very popular procedure of Dr. William Emerson was instigated.

All of you are doubtless familiar with those early methods of combating malnutrition and the results obtained therefrom. The limited number of children who could be reached by such a program showed marked improvement in nutritional status, but unless a youngster was extremely emaciated, there was not much opportunity to include him in the activities. Correction rather than prevention was the usual objective in those early programs.

As the science of nutrition developed, it became apparent that work which was limited to underweight children was wholly inadequate. The poorly fed obese youngster came into the picture and presented his particular problems;

deficiency diseases were recognized and studied; prophylactic measures were carefully mapped out based on the results of scientific investigation; many things other than body weight began to enter into any consideration of malnutrition.

The trend toward preventive measures gained momentum and our nutrition program was reorganized on an entirely different basis. Assuming that all children should know the essentials of good nutrition and should be taught correct health habits in their early years, an effort was made to plan those activities which would include normal as well as abnormal children. Consequently the standard program of classes for the malnourished children was broadened to include all of the children in a chosen grade or section. Supplementary feedings were abandoned. Emphasis was placed on the formation of good health habits and attitudes rather than on gain in weight. Children who failed to grow according to established standards were subjected to intensive follow-up work. They themselves were interviewed individually and their parents were invited into conference with the nutritionists. Interest of the whole school was aroused by the display of posters and exhibits, articles in the school papers, and campaigns in the lunch rooms. The requests for the classes soon exceeded the numbers which could be handled with the limited

* Read at a Joint Session of the Child Hygiene, Foods and Nutrition, and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 9, 1937.

personnel available, and it was necessary to confine the activities to a few selected schools each semester.

In order to broaden the scope and increase the efficiency of nutrition work in the schools, it is hoped that in the near future a coöperative plan involving the classroom teacher and the trained nutritionists as consultants may be placed in operation.

While our school activities were undergoing this evolution, it became increasingly apparent that we were missing a golden opportunity to teach normal nutrition in our own prenatal and child welfare clinics. During the summer of 1930 therefore, a nutritionist was assigned the task of organizing an experimental program in these clinics. Modestly beginning with a group talk once a week in the waiting rooms, this prophylactic service rapidly proved its value. The teaching of normal nutrition has come to be considered an integral part of good prenatal care, and plays such an important rôle in the physical growth and development of children that a nutritionist is now included in the personnel of each clinic. At the present time 5 staff nutritionists divide their time among the 7 health centers and specialized divisions of the department. Their schedules are so planned that it is possible for them to cover approximately 66 per cent of the prenatal and 41 per cent of the baby clinics with regular nutrition service. Normal nutrition with all of its ramifications—food preparation, budgeting, habit training, etc.—is routinely discussed with all patients admitted to the clinics. Individual interviews, group discussions, posters, and exhibits are the technics most frequently used. In addition to normal diet instructions, the nutritionists coöperate with the clinic physicians in planning and explaining to patients any special diet orders that may be deemed necessary. Thus the doctor can use the services of

a scientifically trained person to execute his dietary recommendations. In addition to the work done in the clinics, the nutritionists follow their conferences with visits to the homes of patients. Actual demonstrations of food preparation and detailed planning of budgets can be done better in the seclusion of an environment familiar to the individual. A trip to the market with a housewife is an excellent object lesson in food selection.

For the clinics which are not included in the regular schedule of nutrition work, the nutritionists are on call as needed. Cases requiring help with food problems may be referred to them either by telephone or in writing. Such refers are handled through home visiting.

As the official health agency in the community, the health department is frequently called upon to supply speakers for various organizations and interested groups in the city. Requests for talks on nutrition have been increasing with the growing food consciousness of our population. Last year 28 such requests were handled by the nutrition division in addition to the weekly radio broadcast which has been conducted for the past 3 years. Through the speaker's bureau and our radio programs, we reach a group of people that would be entirely missed if our activities were confined solely to the schools or to our clinics.

In addition to the work done with lay people, the services of the nutritionists of the Health Department are available to any agency in the city who wants to use them as consultants. Frequent committee meetings, conferences, and interviews are held, together with occasional group talks to workers in related fields. To avoid duplication of efforts in nutrition work, close co-operation among the nutritionists in the community is maintained.

The public health nurse working in

a generalized program is invariably called upon to discuss food and diet problems with the families with whom she comes in contact. The assistance she is able to give them in solving their nutrition difficulties should represent the same high standards of accuracy and timeliness as those of her nursing technics; therefore one of the most important phases of our program is the attempt to keep the entire staff of the department well informed and up to date in the science of nutrition. To maintain close enough contact with all field workers to insure uniformity in information given to the public, a plan of staff education has been evolved. At least once each month the nutritionist meets with the nurses working in her district for a discussion of food problems. Case studies, reports of recent literature and scientific meetings supply the material for these group conferences. Individual nurses and other personnel are encouraged to call upon the nutritionists for help either for themselves or for the families under their supervision. Staff members ask for all sorts of help—explanation of a dietary order they have received from their physician, recipes and menus for use in their own homes, literature to send to their friends, food budgets to make their money stretch a little farther, reference material for classwork, and so on. Every one of these contacts provides the opportunity to spread the gospel of good nutrition, and they are easily utilized as teaching situations.

Realizing the growing importance of prophylactic measures in nutrition work, the American Dietetic Association in 1932 made a recommendation to the hospitals sponsoring courses for student dietitians that their training periods could be greatly enhanced by an affiliation with a public health agency doing nutrition work. Consequently the three hospitals* offering such training in Michigan requested

the Detroit Department of Health to provide such an affiliation. Giving these young women a glimpse of the possibilities of preventing many dietary disturbances and showing them the relationship between the patient in the hospital and the members of his family has been of immeasurable benefit both professionally and personally to these potential nutritionists. The 2 weeks spent with the Health Department is eagerly anticipated by most of the students and their presence brings to us a freshness of viewpoint that could not be achieved in any other way.

One of the requirements for the master's degree in public health from the University of Michigan is that the candidate shall have 3 months of practical experience in a recognized agency. When a course was planned, leading to an advanced degree in public health nutrition for students with a home economics background, the Detroit Department of Health was selected as the organization in which such students could obtain the required field work. As yet this curriculum is too new to have sent students to us, but within the next year, we expect to incorporate this activity into our program. It is our aim to give these young people experience in the routine nutrition work in addition to providing them with the opportunity to organize and conduct field studies for us. With 3 months of such experience plus the training in public health administration, statistics, public speaking, etc., which they will receive at the university, they should be well equipped to meet the growing demand for public health nutritionists.

The success of any nutrition program is largely dependent upon the people who are chosen to plan and administer it. Any sort of educational work re-

*Henry Ford Hospital in Detroit, Harper Hospital in Detroit, and University of Michigan Hospital in Ann Arbor.

quires adequate academic preparation and experience. Nutrition is a science whose subject matter is detailed and complex. The well trained nutritionist is a college graduate who has had training in the fundamental sciences—physics, chemistry, and biology—before she begins to specialize in nutrition. Her undergraduate work is done in an institution in which the home economics course is recognized by professional workers in the field. Her academic work is then supplemented by 1 or 2 years of practical experience. For membership in the American Dietetic Association, the professional organization for nutritionists and dietitians, 2 years of practical experience including a period of internship in an approved hospital is obligatory.

In addition to these professional requirements, there are certain personal qualifications necessary. Good health should certainly come first on the list since she must be a good example of the principles she preaches. With obvious nutritional defects herself, such as overweight or underweight, poor physical development, or lack of vitality, her teaching will be discounted by those with whom she comes in contact. Emotional stability and poise, because they indicate mental health, are characteristics which she must possess. The capacity to work well with all kinds of people in all walks of life is important for anyone, but for the nutritionist it is indispensable. Adaptability and ingenuity in making use of available resources is a decided asset. The person who has to wait for ideal working conditions and perfect equipment has no place in the public health field. Sympathetic understanding of and tolerance for individual variations and differences is essential to success in dealing with human beings. The true scientist, and that is what the nutritionist should be, looks at facts and bases judgment upon them rather than

upon personal prejudices and feelings. Because nutrition is a rapidly developing science, the nutritionist must be ever alert to the advances being made. She must keep posted not only in her own field but in all fields directly related to her profession. She must have the initiative and interest which will stimulate her to constant study and professional growth.

If a nutritionist has these professional and personal qualifications, she will be actively interested in her professional associations and organizations. Membership in such groups is evidence of her appreciation of the need for constructive progressive advancement in her chosen field of activity. Unless she has some means of contact with other workers in the same and allied fields, her educational program will not have the breadth of vision which should be its outstanding characteristic.

The objective of the nutrition service in the Detroit Department of Health is the attainment of the best possible state of nutrition for the citizens of the community. To achieve this end, there are several aims guiding the activities of the nutritionists:

1. To arouse an interest in and an appreciation of the relationship existing between good health and normal nutrition
2. To maintain a source of authentic and reliable information on all matters pertaining to the feeding of people
3. To prevent and correct nutritional deficiencies within the limits of an educational program
4. To use every available opportunity to teach sound nutrition principles and encourage the use of those principles in every day living

The methods used in attaining these aims are identical with those employed in any phase of health education. Group discussions in clinics, schools, and community organizations can serve to arouse interest in nutrition; individual conferences, either personal or by correspondence, offer more specific help, and are probably the most effec-

tive technics; radio talks and printed literature have their place in supplying large numbers of people with general information; consultation service for schools and other agencies provide the means for much indirect teaching; and coöperation with educational institutions serve to make future professional workers aware of the possibilities inherent in their chosen field of activity. Posters and exhibits, carefully planned and judiciously used, can contribute materially to the teaching of health subjects. Any well rounded public health nutrition program should make use of a combination of any or all of these

devices. The needs and facilities of the community must be considered in determining the most effective means of disseminating educational material.

If science is to counteract faddism, the official health agency in any community must be prepared to dispense authentic and reliable information on all subjects pertaining to health. Nutrition is no exception, and with the developing food consciousness of our population, the trained nutritionist is rapidly becoming an essential member in the personnel of all organizations which are striving adequately to meet community needs.

Schick Reactions in Students of Medicine

H. C. PULLEY and MOYER S. FLEISHER

Department of Bacteriology, St. Louis University School of Medicine, St. Louis, Mo.

DURING the 7 years 1930-1936, each student in the sophomore class at St. Louis University School of Medicine was Schick tested, and records have been kept. Information has been collected regarding Schick reactions of 816 students, the majority of whom were between the ages of 22 and 27; a few, only 20 or 21, and an insignificant number ranged to 29 years.

Information has been obtained regarding the place of birth and home address of each student as well as personal history of diphtheria, immunization against diphtheria, and administration of antitoxin for therapeutic or prophylactic purposes.

For the purpose of the present study the individuals have been divided into 4 classes according to previous residence on the basis of (1) continuous residence in a larger community, (2) continuous residence in a smaller community, (3) birth in a larger and later removal to a smaller community, and (4) birth in a smaller and later residence in a larger community. Any community of 50,000 population or more has been classed as large, and one of less than 50,000 population was classed as small. In our first attempts to classify according to size of the community we set up 3 classes, 50,000 population and more, between 50,000 and 10,000, and less than 10,000, and 6 further classes as regards place of birth and later residence. It became apparent that the 4 classes listed

gave a simpler, and at the same time a true picture of the occurrence of positive and negative Schick reactions in relation to residence. The 4 groups were suggested largely by the percentage figures of Schick negative reactions among those giving no history of diphtheria or of immunization.

In tabulating the history of the individuals in relation to diphtheria, administration of antitoxin, or in relation to immunization, we have set up initially 7 classifications:

- a. Those who had had diphtheria and immunization (it is not always clear whether these individuals received only antitoxin or both antitoxin and some active immunizing agent)
- b. Those who had had diphtheria but had not been treated with any agent to produce active immunity
- c. Those who had received toxin-antitoxin mixture to produce active immunity
- d. Those who had received injections of unknown nature to produce active immunity
- e. Those who had received prophylactic injections (presumably antitoxin)
- f. Those who had received antitoxin (not having had diphtheria)
- g. Those giving no history of any therapeutic or prophylactic treatment

Certain of these groupings may seem unnecessary, but they may have certain value. In the tabulations the various original groupings relating to history have been combined so that larger and more inclusive groupings are presented as well as the smaller ones. Thus, in a second part of Table II, all individuals having had a diphtheritic infection

TABLE I
Distribution by Residence of the 7 Annual Student Groups

Residence	1930-31		31-32		32-33		33-34		34-35		35-36		36-37		Total	Average
Year →																
	%		%		%		%		%		%		%			%
Larger Communities	72	57	57	49	53	50	62	53	67	53.6	60	57.6	64	52.4	435	53.3
Larger (early)																
Smaller (later)	6	4.8	5	4.3	7	6.6	11	9.4	7	5.6	8	7.7	3	2.5	47	5.8
Smaller (early)																
Larger (later)	10	8	7	6	5	4.7	4	3.4	12	9.6	8	7.7	7	5.7	53	6.5
Smaller Communities	38	30	47	40.6	41	38.6	40	34	39	31.2	28	27	48	39.4	281	34.4

or having received treatment possibly leading to active immunization are listed in one group (*i.e.*, all who might have developed an acquired active immunity), while all others who might not have acquired active immunity through active immunization or through infection are listed in a second group. In Tables III and IV only the figures relating to these 2 summarized groups are presented.

In this group of 816, 72.2 per cent (590) give no history of diphtheria or immunization, while 11.7 per cent (96) give a history of diphtheria. Only 17

per cent (139) of the individuals reported having received active immunization (this includes the group who had diphtheria and were immunized but not those who had diphtheria with no history of active immunization). Only 10.5 per cent reported active immunization but no history of diphtheria, while 5.4 per cent (44) were passively immunized.

Table I shows the distribution by residence in each annual group observed. There is sufficient similarity to justify the assumption that the material is reasonably homogeneous.

TABLE II
Occurrence of Schick Reactions in Relation to Residence and Past History

		(a)		(b)		(c)		(d)		(e)		(f)		(g)			
History		Diphtheria and Immunization		Diphtheria		Toxin Antitoxin Immunization		Other Active Immunization		Prophylaxis (Passive)		Received Antitoxin		No History of Immunization		Total	
Schick →		+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Larger Communities		13	21	5	27	1	10	5	29	2	6	1	6	102	100	127	127
		61.8%		92%		90.9%		85.3%		75%		62%		47%		77.8%	
Larger (early)																	
Smaller (later)		1	2	1	1	—	1	—	2	—	1	1	3	13	25	16	31
														41.5%		40%	
Smaller (early)																	
Larger (later)		1	—	1	—	—	1	—	3	—	1	2	1	15	25	11	24
														43%		40%	
Smaller Communities		4	11	2	8	4	6	7	14	—	2	8	7	113	102	123	127
		73.3%		25%		66.7%		61.7%				44.4%		41.4%		54.4%	
Totals		19	34	7	36	5	21	12	43	2	10	12	21	215	202	250	250
		64.7%		55.6%		62.5%		87%		24.3%		62.5%		60.4%		68.3%	

On the basis of residence in larger and smaller communities, and without regard to the previous history of diphtheria, it will be noted (Table II, Part I, Totals column) that the percentage of negative Schick reactions decreases as we pass from residence in larger communities to residence in smaller, and a sharp drop in Schick negative individuals may be noted when we pass from those who resided for some portion of their life in a larger community. Although in some categories the numbers of individuals are too small to warrant definite statement, there appears the suggestion (Table II, Part I, Columns c and d) that even among those exposed to active immunization the likelihood of developing a negative Schick test is greater with continuous residence in the larger community. Among 45 individuals resident in larger communities 86.7 per cent were Schick negative, while among 34 individuals having lived in smaller communities only 67.6 per cent were Schick negative. The relationship of the Schick reaction to residence is, how-

TABLE II.

Part II

History	All Cases Diphtheria and All Actively Immunized		All Not Actively Immunized	
	Schick → +	—	+	—
Residence				
Larger Communities	22	87 79.8%	105	221 67.8%
Larger (early)	2	6 75%	14	25 64.1%
Smaller (later)				
Smaller (early)	2	4 66.7%	17	30 63.8%
Larger (later)				
Smaller Communities	17	42 71.2%	111	111 50%
Totals	43	139 76.4%	247	387 61%

ever, striking when we consider the group which presumably developed immunity naturally. The Schick negative individuals are slightly more common among those having lived permanently in larger communities than among those having spent some portion of their lives in smaller communities, and considerably

TABLE III

Residence in Larger or Smaller Communities, Past History of Diphtheria or Active or Passive Immunization and Schick Tests Shown by Years

Residence	Years	History	Diphtheria and Immunization Diphtheria, Toxin Antitoxin Active Immunization		Prophylactic Treatment Antitoxin No History	
			Schick → +	—	+	—
Larger Communities	1930-31		3	19 (86.4%)	6	44 (88%)
	31-32		4	8 (66.17%)	12	33 (73.3%)
	32-33		2	6 (75%)	14	31 (68.9%)
	33-34		4	10 (71.6%)	14	34 (70.8%)
	34-35		2	19 (90.5%)	14	32 (60.6%)
	35-36		2	10 (83.3%)	23	25 (52.1%)
	36-37		5	15 (75%)	22	22 (50%)
Smaller Communities	1930-31		..	5	9	24 (72.7%)
	31-32		4	4 (50%)	17	22 (56.4%)
	32-33		3	7 (70%)	13	18 (58.1%)
	33-34		3	5 (62.5%)	18	14 (43.7%)
	34-35		3	6 (66.7%)	17	13 (43.3%)
	35-36		1	2 (66.7%)	13	12 (48%)
	36-37		3	13 (81.2%)	24	8 (25%)

TABLE IV

Comparison of Schick Reactions in Classes of First 3 Years and Last 3 Years by Residence in Larger or Smaller Communities and History (in Two Groups)

Residence	Years	Schick →	History { Diphtheria and Immunization Diphtheria, Toxin Antitoxin Active Immunization		Prophylaxis Antitoxin No History	
			+	—	+	—
Larger Communities	1930-31					
	31-32		9	33 (78.5%)	32	108 (77.1%)
	32-33					
	1934-35					
	35-36		9	44 (83%)	59	79 (57.2%)
	36-37					
Smaller Communities	1930-31					
	31-32		7	16 (69.5%)	89	64 (62.1%)
	32-33					
	1934-35					
	35-36		7	21 (75%)	54	33 (37.9%)
	36-37					

more frequent than among those who resided constantly in smaller communities (Table II, Part 2).

In Table III the classification in relation to residence and Schick reaction, for each of the 7 annual student groups is shown. Only the figures for those individuals who lived constantly in larger and smaller communities are considered here, and only the summarized group relating to past history of diphtheria and immunization are presented. The numbers are small in many cases but certain considerations are suggested. While the per cent of negative Schick reactions among those individuals who were exposed to active immunization remains reasonably high during these 7 years, the same cannot be said as to those not exposed to active immunization. In both the group resident in large and that in smaller communities a tendency toward a progressive fall in the number of Schick negative individuals may be noted in the later years of the study.

When the groups of the first 3 years are combined and compared with the group of the last 3 years covered, these

facts become even more striking in view of the greater number of individuals in each group (Table IV).

The combined figures for these groupings again point to the difference between those living in larger communities and those in smaller communities, and there is the suggestion that even among those who had been exposed to active immunization those living in larger communities stand a better chance of being Schick negative.

Among those actively immunized the difference in per cent of Schick negative reactors between those living in larger and in smaller communities is possibly not significant, but it is interesting that the per cent of Schick negatives is slightly higher in both of the residence groups of the last 3 years.

DISCUSSION

One must be cautious in attempting to draw definite conclusions from data as scanty as those presented here, but certain suggestions seem to appear.

As has been pointed out by others, the relative importance of residence in a larger community in relation to devel-

opment of natural immunity becomes evident, and there is definite suggestion that the chances of developing natural immunity in the smaller sized community is relatively less than in the larger community. Thus if we consider the percentage of Schick negatives in 3 groups:

1. All individuals with some residence in communities over 50,000 population (412 total, 136 positive, 276 negative)

2. All individuals with some residence in medium sized communities, between 10,000 and 50,000 population (137 total, 61 positive, 76 negative)

3. All individuals with some residence in smallest communities, under 10,000 population (197 total, 92 positive, 105 negative)

(These three groups of course overlap)—we find that in (1) 66.2 per cent are Schick negative, in (2) 55.4 per cent are negative, and in (3) 53.3 per cent are negative.

The total percentage of Schick negative individuals in the entire group is probably lower than might be expected (64.5 per cent) in this age group.

The per cent of Schick negatives among individuals who had been exposed to active immunization is somewhat low (76.4 per cent). Peculiarly, this low percentage among actively immunized individuals is chiefly affected by the relatively small number of Schick negative individuals among those who had had diphtheria and gave in addition a history of active immunization.

There is also the suggestion that the percentage of Schick negatives is greater in the larger community group than in the smaller even when comparing only those actively immunized. The difference is, however, not great enough to warrant more than the suggestion that maintenance of the Schick negative state may in some cases be dependent upon repeated exposure.

The most striking suggestion which

appears is that there is the apparent gradual diminution of Schick negatives among those who give no history of exposure to active immunity, during the period covered in this study. While the percentage distribution according to residence varies slightly from year to year it is hardly likely that this factor is responsible for the change. It would rather appear that some other factor accounts for the diminution in negative reactions in the successive groups. It may well be that lack of exposure to sub-clinical contact with diphtheria bacilli is responsible. If this tendency is continued in future years (and it is our intention to continue the study of future classes), it raises certain questions of importance in relation to control of diphtheria.

Since it is assumed that the development of immunity to diphtheria in non-actively immunized individuals is related to possibilities for contact with the causative agent, and if active immunization within a community tends to reduce the opportunities for contact of the non-immunized individual with diphtheria bacilli, then those individuals who are not actively immunized must be particularly guarded, or the campaigns for active immunization must be pressed with greater vigor so as to cover as nearly 100 per cent of individuals as possible.

CONCLUSIONS

1. In 7 successive groups of medical students studied, the importance of the place of residence—large or small community—is evident in relation to the development of a negative Schick reaction.

2. The percentage of Schick negative individuals is rather lower than might be expected in such an age group.

3. There is evident the suggestion that the percentage of Schick negative individuals among those not exposed to active immunization, has steadily decreased over the period of this study.

Evaluation of Dental Programs for Children*

J. M. WISAN, D.D.S., F.A.P.H.A.

*American Society for the Promotion of Dentistry for Children,
Elizabeth, N. J.*

A STUDY of public health literature will reveal a need of technics for evaluating dental programs. This void exists in measuring community dental programs and analyzing trends in dental health of individuals, communities, and nations.

This discussion will be limited to two points:

1. The chart recently designated as a national chart for group inspections of school children to determine dental needs
2. The Lost Permanent Tooth Index for evaluating dental programs among school children

NATIONAL DENTAL INSPECTION CHART

This chart (Figure I) is to be used in surveying dental needs of school age children. It is hoped that the designation by the American Society for the Promotion of Dentistry for Children, the American Dental Association, and the proposed sanction of the American Public Health Association, will result in widespread adoption. If this form is used as a basis of dental inspection charts in all local and state dental programs, it will be possible within a few years to make more accurate comparisons and to determine dental needs with greater uniformity. However, a valid

and reliable method for evaluating dental programs is required. The Lost Permanent Tooth Index is suggested for this purpose.

LOST PERMANENT TOOTH INDEX

HOW IS IT OBTAINED?

The teeth of 12-14 year old children are examined by a dentist. This age group is selected because 28 permanent teeth should be in place, that is, all but the 4 third-permanent molars or "wisdom" teeth. Then, too, 7th and 8th grade conditions indicate the results of more than 6 years of service and/or instruction.

Two items are observed and charted: (1) Permanent teeth requiring extraction, (2) Permanent teeth previously extracted. Both constitute what may be termed "lost permanent teeth."

By using the compiling chart (Figure II) it is possible to obtain:

1. *The number of lost permanent teeth per 100 children*—By lost permanent teeth is meant the total of both permanent teeth requiring extraction and previously extracted permanent teeth.
2. *The percentage of children with lost permanent teeth*—That is, the percentage of children having permanent teeth requiring extraction and or previously extracted permanent teeth.

It may be noted that this Index does not evaluate dental programs for

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

preschool children. The author is preparing a Lost Deciduous Molar Index for this purpose.

Is the suggested method of evaluating dental programs practical, valid, and reliable?

little time (1 minute or less per pupil) consumed in obtaining the data for this Index would seem to indicate that this method of evaluating dental programs is practical.

PRACTICABILITY

The simplicity of the technic and the

VALIDITY

The White House Conference on Child Health and Protection designated

FIGURE I

National Dental Inspection Chart for School Children

For dentists using mouth mirror and explorer.

Last Name	First Name	City or County	State
Date of Examination	Age	Months	Sex
	Years		Color
School	Grade		

1. Is dental treatment indicated?	Yes	No
2. Has child ever received dental treatment?	None	
	Fillings	
	Extractions	
3. Number of teeth which have been filled	Deciduous	Permanent
	Deciduous	Permanent
4. Number of teeth requiring	Extraction .....	.....
	Fillings .....	.....
5. Number of missing teeth (Extracted permanent teeth only)		
6. Condition of gums	Normal	Diseased
7. Is orthodontic treatment indicated?	Yes	No

7	6	5	4	3	2	1	LAB	1	IAL	2	3	4	5	6	7
RIGHT UPPER							LEFT UPPER								
							LING	UAL							
							A	A							
							B	B							
							C	C							
							D	D							
							E	E							
RIGHT LOWER							LEFT LOWER								
LAB	IAL														
7	6	5	4	3	2	1	I	I	2	3	4	5	6	7	

✓ Extraction.

FIGURE II
COMPILING CHART
LOST PERMANENT TOOTH INDEX

[illegible]

"The retention of the permanent teeth, sound and healthy, functioning adequately and with comfort"¹ as an objective of dental programs.

Inasmuch as this Index shows the number of lost permanent teeth and indicates to what extent the permanent teeth are being retained in sound vital condition, it does measure dental health in accordance with a standard set by an authoritative body.

that this Index does measure dental health conditions:

1. It was noted that the children in communities of less than 5,000 population had lost fewer permanent teeth than did children in the more populated communities.
2. Negro children had fewer lost permanent teeth than white children.
3. Other conditions being similar, children in communities with well planned dental programs showed fewer lost permanent teeth than those in communities without programs.
4. Children in communities of high eco-

FIGURE III

How the Lost Permanent Tooth Index Enables One to Compare Contemporary Programs

<i>Town A</i>	<i>Date—October, 1937</i>	<i>Town B</i>
70%	7th and 8th grade children with lost permanent teeth	50%
150	Number of lost permanent teeth per 100 children—7th and 8th grades	170

FIGURE IV

How the Lost Permanent Tooth Index Enables One to Measure Progress Attained by Dental Progress

March, 1932	7th and 8th grade children with lost permanent teeth	55%
March, 1936	7th and 8th grade children with lost permanent teeth	40%
March, 1932	Number of lost permanent teeth per 100 children—7th and 8th grades	140
March, 1936	Number of lost permanent teeth per 100 children—7th and 8th grades	90

Figure III shows how the Lost Permanent Tooth Index may be used to compare contemporary programs.

Figure IV indicates how it may be used to measure progress within a community.

The following conclusions, arrived at by studying the Lost Permanent Tooth Index of 650 communities as obtained from the U. S. Public Health Dental Survey of School Children,² indicate

conomic level had fewer lost permanent teeth than children in poorer communities.

See Figure V for data.

RELIABILITY

The reliability of this Index was tested by having a number of dentists examine the same children. Uniformity ranged from 85 to 95 per cent.⁶ evidence of satisfactory reliability.

$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

FIGURE V

1. AVERAGES ACCORDING TO SIZE OF COMMUNITY

Population	Lost Permanent Teeth per 100 Children
100,000 and over	80.8
25,000-99,999	90.2
10,000-24,999	70.0
5,000-9,999	75.8
Under 5,000	54.6

2. COMPARISON OF NUMBER OF LOST PERMANENT TEETH AMONG WHITE AND NEGRO CHILDREN

	Lost Permanent Teeth per 100 White Children	Lost Permanent Teeth per 100 Negro Children
In 22 cities	51.4	36.6

3. COMPARISON OF NUMBER OF LOST PERMANENT TEETH AMONG CHILDREN IN COMMUNITIES HAVING DENTAL PROGRAMS AND AMONG CHILDREN IN COMMUNITIES NOT HAVING DENTAL PROGRAMS

Communities With Dental Programs

	Lost Permanent Teeth per 100 Children
Pontiac, Mich.	19.3
Atlanta, Ga.	26.5
Des Moines, Ia.	41.3

Guggenheim Clinic (New York) Report

	Lost Permanent Teeth per 100 Children
Children entering service early with regular treatment	36
Children obtaining late dental care (10 years or over)	105

Communities Without Dental Programs or With Inadequate Programs

	Lost Permanent Teeth per 100 Children
Camden, N. J.	142
Lyndhurst, N. J.	199
Pittsburgh, Pa.	138.6

4. COMPARISON OF NUMBER OF LOST PERMANENT TEETH AMONG CHILDREN IN COMMUNITIES OF HIGH ECONOMIC LEVEL AND AMONG CHILDREN IN COMMUNITIES OF LOW ECONOMIC LEVEL

High Economic Level	Lost Permanent Teeth per 100 Children
Englewood, N. J.	73
Westfield, N. J.	49
Palo Alto, Calif.	11

Low Economic Level	Lost Permanent Teeth per 100 Children
Rahway, N. J.	168
Hoboken, N. J.	156
Garfield, N. J.	169

Note: Above data applied to children 12-14 years.

ATTAINABLE STANDARDS

The question is frequently asked:
"What may be considered attainable

standards?" Tentatively, it is suggested that attainable standards among white children be set in accordance with economic status. We may reasonably expect that the number of lost permanent teeth per 100 white children of 12-14 years would be:

For Economic Level	Lost Permanent Teeth per 100 Children (12-14 Yrs.)
\$5,000 and up	0-19
\$2,000-\$5,000	20-49
Below \$2,000	50-70

These suggested attainable standards merit conditional acceptance for the purpose of further study and analysis.

The author believes that, including all of the following will, in 5 years, effect results indicated by the suggested attainable standards: (1) educational programs to improve nutritional and dental practices, (2) repetitive dental inspections by dentists using mouth mirror and explorer plus follow-up guidance programs, and (3) preventive dental service programs for underprivileged children with emphasis on pre-school and lower elementary grade children, and treatment provided for older children as well. *Dental service programs based on emergency treatments will not reduce the number of lost permanent teeth.*

Summarizing, the adoption of the National Dental Inspection Chart for School Children will aid all communities to determine dental needs among children with greater uniformity. The use of the Lost Permanent Tooth Index is recommended as a reliable, valid, and practical means of evaluating dental programs among school children.

BIBLIOGRAPHY

1. White House Conference on Child Health and Protection: *The School Health Program*. Section III C. New York: Century Co., 1932, p. 101.
2. *Pub. Health Bull.* 226. Washington, D. C.: Gov. Print. Office, 1936.

Public Health Degrees and Certificates Granted in 1937

THE Committee on Professional Education of the American Public Health Association presents the following tables which are similar to those published in previous years covering data concerning students registered in schools of public health, and the public health degrees granted in the calendar year 1937.

COLLEGE ENROLLMENT IN PUBLIC HEALTH COURSES

Number of students enrolled, and Public Health Degrees and Certificates conferred in the year 1937 by United States and Canadian Universities. Unless otherwise indicated courses require at least 1 year of residence.

TABLE I

Name of University	No. of Students Registered 1936-1937			Degrees Offered	No. of Degrees Granted 1937		
	Men	Women	Total		Men	Women	Total
University of California	107	15	122	Dr.P.H.	0	0	0
				M.A.	0	0	0
				A.B.	3	4	7
				C.P.H.	16	1	17
				Certif. of Completion ¹	82	1	83
DeLamar Institute of Public Health, Columbia University	11	3	14	M.S.P.H.	15	6	21
Harvard School of Public Health	36	6	42	Dr.P.H.	1	0	1
				M.P.H.	18	2	20
				C.P.H.	6	0	6
Johns Hopkins School of Hy- giene and Public Health	132	24	156	Dr.P.H.	4	0	4
				Sc.D. in Hyg.	0	2	11
				Sc.M. in Hyg.	0	0	0
				C.P.H.	65	0	65
Massachusetts Institute of Tech- nology	53	15	68	S.B.	5	0	5
				S.M.	0	1	1
				Sc.D.	0	0	0
				Ph.D.	1	1	2
				Dr.P.H.	0	0	0
				C.P.H.	3	1	4
McGill University	0	0	0	D.P.H. ²	0	0	0
University of Michigan	127	28	155	Dr.P.H.	3	0	3
				M.S.P.H.	22	1	23
University of Minnesota	18	0	18	B.A.	0	0	0
				M.A.	0	0	0
				B.S.	0	0	0
				M.S.	1	0	1
				C.P.H.	3	0	3
				Ph.D.	0	0	0

TABLE I (Cont.)

Name of University	No. of Students Registered 1936-1937			Degrees Offered	No. of Degrees Granted 1937		
	Men	Women	Total		Men	Women	Total
University of Toronto School of Hygiene	17	0	17	D.P.H. ³	17	0	17
Wayne University College of Medicine	2	1	3	Dr.P.H.	1	1	2
University of Western Ontario Faculty of Public Health	0	0	0	D.P.H. ³	0	0	0
Vanderbilt University Dept. of Preventive Medicine and Public Health	44	0	44	Certif. of Com- pletion ¹	44	0	44
Yale University Department of Public Health	19	7	26	M.P.H.	1	2	3
				Dr.P.H.	5	0	5
				Ph.D.	1	0	1
Total	566	99	665		326	30	356

1. Short courses not over 1 semester in length.

2. Some of these students took work over a 2 year period.

3. Diploma in Public Health.

CLASSIFICATION OF PUBLIC HEALTH DEGREES AND CERTIFICATES GRANTED IN 1937

Number of persons receiving Degrees and Certificates by reason of public health courses completed:

TABLE II

Degree	No. of Degrees Granted	No. of Schools Offering Degrees
Doctor of Public Health	15	7
Doctor of Science	11	2
Doctor of Philosophy	3	3
Certificate in Public Health	95	5
Master of Public Health	23	2
Master of Science in Public Health	51	2
Master of Science	2	3
Master of Arts (Public Health Major)	0	2
Diploma in Public Health	17	3
Bachelor of Science in Public Health	5	2
Bachelor of Arts (Public Health Major)	7	2
Certificate of Completion	127	2
Total	356	

Number of Degrees and Certificates conferred by United States and Canadian Universities for 1935, 1936 and 1937:

TABLE III

School	Degree	1935	1936	1937
University of California	A.B.	2	0	7
	C.P.H.	0	0	17
	Certificate of Com- pletion	0	0	83

TABLE III (Cont.)

<i>School</i>	<i>Degree</i>	<i>1935</i>	<i>1936</i>	<i>1937</i>
DeLamar Institute of Public Health	M.S.P.H.	9	11	21
Harvard School of Public Health	Dr.P.H.	0	2	1
	M.P.H.	13	20	20
	C.P.H.	6	4	6
Johns Hopkins School of Hygiene and Public Health	Dr.P.H.	6	7	4
	Sc.D. in Hyg.	6	5	11
	Sc.M. in Hyg.	3	4	0
	C.P.H.	28	41	65
Massachusetts Institute of Technology	S.B.	13	9	5
	S.M.	1	0	1
	Ph.D.	0	0	2
	C.P.H.	3	0	4
McGill University	D.P.H. ¹	0	2	0
University of Michigan	Dr.P.H.	3	5	3
	M.S.P.H.	22	11	30
University of Minnesota	M.S.	No Figures	No Figures	1
	C.P.H.	No Figures	No Figures	3
University of Toronto	D.P.H. ¹	11	10	17
Wayne University College of Medicine	Dr.P.H.	0	0	2
University of Western Ontario	D.P.H. ¹	No Figures	No Figures	0
Vanderbilt University	Certificate of Completion	No Figures	No Figures	44
Yale University	M.P.H.	0	1	3
	Dr.P.H.	1	1	5
	Ph.D.	1	1	1
	C.P.H.	2	0	0
	M.S.	1	0	0
Total		131	134	356

1. Harvard does not give the C.P.H. as a degree.

2. Diploma in Public Health.

Total number of Degrees and Certificates in Public Health granted in the United States and Canada, 1935, 1936 and 1937:

TABLE IV

<i>Degrees and Certificates</i>	<i>1935</i>	<i>1936</i>	<i>1937</i>
Dr.P.H.	10	15	15
Sc.D.	6	5	11
Ph.D.	1	1	3
C.P.H.	39	45	95
M.P.H.	13	21	23
M.S.P.H.	31	22	51
M.S.	5	4	2
M.A.	0	0	0
D.P.H. ¹	11	12	17
B.S.	13	9	5
B.A.	2	0	7
Certificate of Completion	0	0	127
Total	131	134	356

1. Diploma in Public Health.

COLLEGE ENROLLMENT IN COURSES FUNDAMENTALLY ENGINEERING IN CHARACTER BUT PROVIDING TRAINING IN PUBLIC HEALTH WORK

TABLE V

Name of University	College Enrollment 1934-1937			Total	Degrees Offered	Number of Degrees Granted			
	1934-1935	1935-1936	1936-1937			1935	1936	1937	Total
Agricultural & Mechanical College of Texas	5	11	8	24	B.S. in C.E. (San. Eng. option) M.S. in Municipal & San. Eng.	4	6	6	16
Cornell University	15	12	4	31	B.S. in C.E. (San. Eng. option) M.C.E. (San. Eng. option) M.S. (San. Eng. option)	1	0	1	2
Harvard University (Graduate School of Engineering)	13	26	47 ¹	86	S.M. in Eng. (Sanitary) S.D.	7	8	1	16
Iowa State College	8 Undergrad. 2 Graduates	7 Undergrad. 1 Graduate	7 Undergrad. 1 Graduate	22 Undergrad. 4 Graduates	B.S. in C.E. (San. Eng. option) M.S. in C.E. (San. Eng. option)	9	7	35	51
Johns Hopkins University	5	11	11	27	Bachelor of Engineering Master of Engineering Doctor of Engineering	0	1	0	1
Lehigh University	2	1	2	5	B.S. in San. Eng.	2	4	2	8
Massachusetts Institute of Technology	18	17	10	45	S.B. in P.H. Eng. S.M. in P.H. Eng. Ph.D. in P.H. Eng. Sc.D. in P.H. Eng. D.P.H. in P.H. Eng. S.B. in San. Eng. S.M. in San. Eng. Sc.D. in San. Eng.	0	0	0	0
New York University	10 Undergrad. 8 Graduates	20 Undergrad. 18 Graduates	19 Undergrad. 32 Graduates	49 Undergrad. 58 Graduates	B.S. in C.E. (San. Eng. option) M.S. in C.E. (San. Eng. option) Engineer in C.E.: San. Eng.	9	20	18	47
Stanford University (Graduate School)	3	2	2	7		1	4	4	9
State University of Iowa	5 Undergrad. 1 Grad. with M.S.	3 Undergrad. 1 Grad. with M.S.	9 Undergrad. 1 Grad. with M.S.	17 Undergrad. 3 Graduates	B.S. in Eng. (San. Eng. option)	6	4	10	20
University of California	30	30 ²	50 ²	110	B.S. in Eng. (San. Eng. option) M.S. in Eng. (San. Eng. option)	20	9	8	37
University of Illinois	5	6	3	14	B.S. in C.E. M.S. in C.E. Ph.D.	2	2	1	5
University of Kansas	6	6	5	17	B.S. in C.E. (San. Eng. option) M.S. in C.E. (San. Eng. option) M.S.	1	3	0	4
University of Minnesota ^a	No figures	No figures	16	16		3	3	2	8
West Virginia University	6	6	0	12	B.S.C.E. (San. Eng. option)	No figures	0	0	0
Total	142	178	227	547		6	6	0	12
1. 2 were special students, 1 part time and 2 not degree candidates.									
2. Of these 2 were graduate students.									
3. Department of Preventive Medicine & Public Health—special short courses.									
Summary:	No. of Students	Registered	1934-1935	142	No. of Degrees Granted	1934-1935	1935-1936	1936-1937	Total
"	"	"	1935-1936	178	"	90	99	107	296
"	"	"	1936-1937	227	"	90	99	107	296
Total				547	Total	90	99	107	296

PUBLIC HEALTH NURSING DEGREES AND CERTIFICATES
GRANTED 1936-1937

In the Academic Year 1936-1937 there were 2,408 graduate students and 58 undergraduate students registered in public health nursing courses approved by the National Organization for Public Health Nursing. In the summer session or the 4th quarter of 1937 there were 1,040 graduate students and 3 undergraduate students enrolled. The following table indicates the number of students who received degrees and certificates in Public Health Nursing for this period. These figures have been supplied by the National Organization for Public Health Nursing and are printed here with permission. NOTE: No report received from Simmons College.

TABLE VI

<i>Course</i>	<i>Certificates</i>	<i>B.S. or B.A. Degree</i>	<i>M.S. or M.A. Degree</i>
University of California Division of Nursing Education	47	53	0
Catholic University of America School of Nursing	5	3	0
University of Michigan Division of Hygiene and Public Health	13	12	2
Wayne University Nursing Education Department	51	5	0
University of Minnesota Department of Preventive Medicine and Public Health	34	18	0
Teachers College, Columbia University Department of Nursing Education	0	38	10
Fordham University Social Service Department	3	0	0
Syracuse University Department of Public Health Nursing	9	2	0
Western Reserve University School of Applied Social Sciences	52	18	3
University of Oregon Medical School Department of Nursing Education	11	6	0
University of Pennsylvania Department of Nursing Education	9	3	0
George Peabody College for Teachers Nursing Education Department	32	15	2
Vanderbilt University School of Nursing	16	4	0
College of William and Mary, Richmond Division School of Social Work and Public Health	27	3	0
Medical College of Virginia St. Philip School of Nursing	4	0	0
University of Washington School of Nursing Education	35	27	1
University of Hawaii School of Applied Science	13	0	0
Total	361	207	18

For the school year 1936-1937 the total course registration was reported as 3,509 as compared with 3,353 in 1935-1936, an increase of 156 students. The number who received certificates or who completed the full public health nursing program in the school year 1936-1937 or who received degrees was 586 as compared with 445 in 1935-1936, an increase of 141.

(For Committee members, see next page.)

COMMITTEE ON PROFESSIONAL EDUCATION

W. S. LEATHERS, *Chairman*

E. L. BISHOP

ALLEN W. FREEMAN

PEARL McIVER

STANLEY H. OSBORN

CLARENCE L. SCAMMAN

WILSON G. SMILLIE

JOHN SUNDWALL

RALPH E. TARBETT

HENRY F. VAUGHAN

REGINALD M. ATWATER

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

July, 1938

Number 7

MAZYCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MANCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

WESTERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION

NINTH ANNUAL MEETING PORTLAND, OREGON

THE Western Branch celebrated its tenth birthday in Portland, Ore., June 6-8, the city in which it was organized on June 18, 1928. Dr. Frederick D. Stricker, long-time State Health Officer of Oregon, who made the motion to form a permanent Western Branch of the A.P.H.A., ten years ago, was made President-Elect.

The meeting was welcomed by the Mayor of the city, the Honorable Joseph K. Carson. Unfortunately the Governor of Oregon was detained. The President, Dr. P. W. Covington, opened the meeting with a historical sketch, after which the regular program was taken up.

The program throughout was excellent, full of interest for every class of membership. Deserving of special mention was the discussion "Progress in Public Health Under Title VI of the Social Security Program," by Assistant Surgeon-General C. E. Waller. This gave, for the first time that we know of, many facts in which all public health workers are interested. Other high lights of interest included a discussion of syphilis control, therapy, and laboratory aids; a panel discussion of public health nursing functions; a symposium on school and college hygiene; newer developments in plague distribution, dissemination, and control; and a discussion of tourist camp sanitation.

There were several sections, among which the laboratory workers deserve particular mention. This section had the largest attendance on record. Every state in the Western Branch and the Province of British Columbia were represented. Notable among the papers were "Developments in the Slide Test for the Diagnosis of Syphilis" and "The Culture of the Gonococcus."

The registration at the meeting approximated 550. The attendance was also the greatest of any meeting since this organization was formed. The membership of the Western Branch is now more than 1,300, of whom 801 are Fellows or active members of the parent Association.

This meeting saw the election of an unusual number of new members, since Dr. Fred T. Foard, Surgeon, U. S. Public Health Service, conducted an aggressive campaign for members throughout the Western Branch territory, and from his own pocket offered a \$25 cash prize for the state health officer who obtained the largest number of applications between January 1 and June 6, 1938.

An honor scroll was provided by Dr. P. W. Covington, the President, to be awarded to the state health officer who obtained the largest number of applications for membership in relation to population. This scroll is to be engraved with the name of the state health department winning it, to remain in its possession until it is awarded on the same basis again to the same state or to some other. This plaque is the property of the Western Branch, and is named in honor of its donor "The Platt W. Covington Honor Scroll." Both of these were awarded to Dr. J. L. Jones, State Health Officer of Utah.

A number of other organizations met at the same time and in the same hotel, and shared in the meetings of the Western Branch. Among these were the Conference of State Supervisory Nurses, Conference of City and County Health Officers of Oregon, Washington State Public Health Association, Oregon Nutrition Council, Northwest Association of Milk Inspectors, and the Oregon Milk Inspectors' Association.

The exhibits, both commercial and scientific, were excellent. Perhaps those of the Los Angeles City Board of Health on "Rabies" and that by the Montana Rocky Mountain Spotted Fever Laboratory at Helena, Mont., deserve special mention. In the latter were unquestionably the best exhibits of ticks concerned in the transmission of spotted fever which are in existence. It was also illustrated by the most beautifully done drawings.

The annual banquet took place on Tuesday evening, and was attended by more than 400. A most unusual, but none the less welcome and honored guest, was Darigold Periwinkle, owned by Mr. and Mrs. M. C. Fleming of Portland, who is the World Champion Golden Guernsey. Perhaps her presence had something to do with the meetings of the Northwestern and Oregon Milk Inspectors' Associations and the fact that the dairying industry in the Northwest is going ahead by leaps and bounds. In the general discussions, the sanitation of milk production and pasteurization were well to the fore.

Toward the end of the banquet Dr. Guy S. Millberry, President-Elect, succeeded Dr. Platt W. Covington as President for the ensuing year.

It was especially pleasant to see the large number of Canadian visitors, headed by the honored Dean of health officers, Dr. Henry E. Young of Victoria.

The hospitality of Portland is famous, and those in attendance who had not experienced it before were fully convinced that none of the reports of it which had reached them had been exaggerated. Entertainments, especially for the ladies, were provided in abundance, including drives and trips to some of the most interesting places within a hundred miles of Portland. We need hardly call attention to the fact that Portland is famous for its beautiful location, the two grand mountains that are in full view of it, and many other points of interest as well as beauty. All who were fortunate enough to attend this meeting will look forward to the first opportunity again to visit Portland, the City of Roses.

Other officers elected in addition to Dr. Stricker were: *Vice-Presidents*, Dr. J. D. Dunshee, Director, Local Health Administration, State Board of Health, Phoenix, Ariz.; E. H. Bramhall, Director of Laboratories, State Board of Health,

Salt Lake City, Utah; Anna L. Heisler, Supervising Nurse, U. S. Public Health Service, San Francisco; *Secretary*—Dr. W. P. Shepard, Metropolitan Life Insurance Company, San Francisco, Calif.; *Treasurer*—W. Ford Higby, Executive Secretary, California Tuberculosis Association, San Francisco. New Regional Board members elected were: Dr. R. L. Cleere, State Health Officer, Denver, Colo.; Dr. E. B. Godfrey, State Health Officer, Santa Fe, N. M.; Dr. A. U. Simpson, Director of Laboratories, State Department of Health, Seattle, Wash.; Elizabeth Soule, Director of Public Health Nursing, University of Washington, Seattle, Wash.; Dr. Helen A. Cary, Medical Director, Division of School Hygiene, Bureau of Health, Portland, Ore.

The next meeting will be in the San Francisco Bay Region in May or June, 1939.

ESTIMATES OF NUTRITIONAL STATUS

OF recent years communities have shown an increasing interest and participation in programs for the improvement of the nutritional status of their children. Frequently a considerable portion of the public health budget is expended for this purpose. In such programs, the routine examination of groups of children by a physician to identify the malnourished ones and give them special consideration is a commonly accepted procedure. Yet a recent paper in the *Public Health Reports* indicates that such an activity may not be as effective as it was previously considered. This conclusion is based upon the finding that there are wide disagreements in the nutritional estimates of the same children by different physicians. For example: It was shown that out of 108 boys examined by 6 physicians, 25 were judged malnourished by at least one of the physicians, yet only one child was so considered by every examiner. In a second sample of 113 girls examined by a second group of 6 doctors, 65 were judged to be malnourished by at least one physician and only 4 were so considered by all 6 of them. These disagreements are summarized in the statement that "the rating of nutritional status which any child is given depends to a large extent on which doctor makes the rating."

The practical significance of these findings so far as individual children are concerned is pointed out in the following illustration. If Dr. A had been a regular school physician and had examined the 113 girls, she would have indicated that 32 of them needed special attention to improve their nutritional condition. If Dr. B had been the school physician, she, likewise, would have indicated that 32 of the girls needed special service. But only 17 of those judged malnourished by Dr. A were so considered by Dr. B. Each doctor selected 15 as malnourished that were considered normal by the other physician. These data indicate the futility of nutritional programs that give special attention to a few cases regarded as deficient in nutritional status on the basis of a routine physical examination. The errors in the doctor's estimates are too great to justify the extra effort given to the individuals chosen.

It is also pointed out that the use of such judgments to determine the prevalence of malnutrition at any one time or to measure changes in the prevalence over a period of time is apt to be misleading. Wide differences in the incidence of malnutrition may arise because of the variation in the judgments

of the doctors. For example, one physician found 7 times as many malnourished children in the group of boys as did a second physician.

The findings of this paper are not altogether new to physicians. They have always known that their judgments were not infallible. Even under the best of conditions where a clinical history and some information on the hereditary background of the child may be obtained, a pronouncement on his nutritional status is difficult. Despite this difficulty the best advice a mother can obtain on an individual child is that given by a physician after he has had sufficient time to examine and study the child. But under the less favorable conditions of a rapid routine examination, such as is usually given in schools or on surveys, the difficulties of accurate nutritional estimates are practically insurmountable and such disagreements are likely to occur.

As a substitute for programs based on rendering service to a few children specially selected on such unreliable estimates, it is suggested that attention be focused on the discovery of those individuals who have faulty food habits, or whose behavior symptoms such as failure to gain in weight, lack of stamina, and lassitude, suggest the need for medical advice. Thus the interest would be in preventing the occurrence of malnutrition as well as correcting it after it occurs.

It is also suggested that research workers concentrate on the construction of valid methods of determining nutritional status rather than making surveys which are of doubtful significance because of the inaccuracies of the estimates upon which their findings are based.

Though there is no evidence to show that these two suggestions are the proper procedures, yet they would seem to warrant experimental trial by those responsible for nutritional programs.

REFERENCES

- Derryberry, M. *Pub. Health Rep.*, 53:263-268, 1938.
Franzen, Raymond. *Physical Measures of Growth and Nutrition*, Chapter 1, American Child Health Association, 1929.

THE DEAD HAND OF AUTHORITY

MANY years ago, Oliver Wendell Holmes said he had learned three things in Paris: "Not to take authority when I can have facts, not to guess when I can know, and not to think a man must take physic because he is sick." Holmes had been under the influence of the New School of Medicine in Paris, of which Louis was the founder and great representative. Louis abandoned a lucrative practice and "gave nearly 7 years, including the flower of his bodily and mental powers . . . to vigorous, impartial observation." Everyone who thinks, and perhaps especially everyone who writes, knows that the lesson learned by Holmes and passed on by him still needs to be emphasized. No one can deny the great debt which we owe to the Fathers and no one would detract one jot or tittle from their credit, for "it is a sign of a dry age when the great men of the past are held in light esteem." Nevertheless, too many of us are bound by the dead hand of authority.

Religious authority for centuries stood in the way of the advances of medicine. Within the time of practically every reader of this *Journal* authority has denied certain great scientific truths and hindered progress in biology and medicine. The general subject has recently been reviewed in a masterly address,¹ in which

are recalled some outstanding examples of the influence of the dead hand of authority over advance in the medical sciences. We remember the interdictions against the dissection of the human body and the long delay in the most rudimentary knowledge of the body which resulted. Harvey, the discoverer of the circulation of the blood, had to leave Cambridge and go to Padua, but it is said that even he in his later life came more or less under the influence of authoritarian thought. John Mayow (1645-1649) made discoveries concerning what we now call oxygen and its rôle in respiration which would have been revolutionary if carried to their legitimate conclusions. He showed that blue venous blood became red by the absorption of something which he called the "igneo-aerial" particles of the air. Joseph Priestly (1771) made accurate experiments but did not draw correct conclusions owing to the influence of the dead hand. The influence of Stahl (1737), with his doctrine of animism, which was a revamping of vanHelmont's "sensitive soul" as a source of all vital phenomena, is said to have blocked progress in the chemical aspects of physiology throughout the 18th century. It was only when Lavoisier (1775) announced his discoveries that the atmosphere was cleared and many observations "fell into their place, as at the touch of a magician's wand."

It seems to many people that authority still plays too great a part in the ordinary medical education. Much of this is probably due to lack of preparatory education and to the greater or less amount of mysticism with which the ordinary mind endows anything pertaining to medicine. It is true that some professors, unfortunately too few, have the power of developing originality in their students and of inspiring in them a desire for research, but to a great extent this curiosity to unearth basic facts is born and not made, though it can be fostered. There is no doubt that the average teacher could do more than he does to cultivate an open mind controlled by critical judgment. Sir Walter Langdon-Brown holds, correctly we believe, that in spite of the faults which exist in our present system of medical education "every medical school is a guardian for the future of truth." The views of Sir Walter have brought forward other considerations. The writing of textbooks by young and inexperienced men brings about the "perpetuation of accepted views which have not been redissolved and recrystallised from experience."² Bad as this is in medicine, it is probably worse, or more frequent, in hygiene and preventive medicine. The market is flooded with such efforts, many of which add nothing to knowledge, and do not even present facts as well as the texts from which they are taken.

What shall we say about preventive medicine? Do not the same conditions apply? We believe so, but to a lesser extent, since public health as we understand it today, is a new development. It is true that the ancient Greeks developed personal hygiene to a high degree and that the Romans were well advanced in public sanitation in the way of baths, abundant water supplies, sewerage, disposal of refuse, and things of that nature, as early as 494 B.C. All of these things passed in the Dark Ages except the control of epidemics. It is also true that the Jewish code of hygiene, as found in Leviticus, was the earliest known and even today is recognized as sound. While isolated studies such as that of the Broad Street Pump epidemic in London (1854) taught sound lessons, the birth of modern preventive medicine may be dated from the researches of Pasteur. In spite of all that bacteriology has done for medicine

and preventive medicine, it seems to have overshadowed some important matters, and in a way has delayed the recognition of the importance of other factors in public health. The deficiency diseases, for example, were perhaps not recognized as early as they might have been. In spite of the progress on which we have good reason to congratulate ourselves, there are still subjects of great importance which are knocking at the door of public health,³ among which mental hygiene, psychology and psychotherapy are the newest and most prominent applicants. The place of mental hygiene is fairly well established and a recent writer holds that there is even an epidemiology for it.

REFERENCES

1. Sir Walter Langdon-Brown. *Lancet*, Jan. 29, 1938, p. 277.
2. Editorial. *Lancet*, Jan. 29, 1938, p. 269.
3. Editorial. *A.J.P.H.*, Feb., 1938, p. 193.

A CONTRAST

RELIGION and medicine have often found themselves in conflict, especially as to certain rites and observances. The pilgrimages of India are notable in this respect, have cost tens of thousands of lives, and have been the means of spreading cholera over large areas. The number of pilgrims is estimated at 20 million annually.¹ One can imagine nothing more ghastly than the reports of some of these only a few years ago. The sacred Ganges, which is 1,600 miles long, is bathed in as a religious duty by millions, made up not only of those living near its banks, but of pilgrims, and the dead are cast into its waters. Sickening accounts have been written by Hunter, the Bishop of Calcutta, and by Bishop Wilson, among others. At the feast of Juggernaut, the Temple kitchen has the monopoly of cooking for the multitudes. The food cooked there is too sacred for any of it to be thrown away. It undergoes putrefactive fermentation, and within 48 hours is a loathsome mass unfit for human food, yet it forms the chief nourishment for thousands. The housing could not be worse. As many as 80 persons pass the night in lodgings 13 feet long, 10 feet broad, and 6½ feet high. The stench is said to be overpowering, and as many as 90,000 people are packed together for a week in 5,000 of these lodgings. Bishop Wilson estimates the slaughter of one pilgrimage at 50,000, and says that the description given of one might well be used for all the great pilgrimages—at least a dozen. Hunter states that 24 high festivals take place annually at Juggernaut. From the accounts it is not surprising that Bishop Wilson has said that Hindostan "well deserves the reputation it universally possesses of being the birthplace and settled home of the malady."²

The contrast showing the introduction of modern medicine is so great as almost to pass belief.³ Since the whole world is interested in preventing the spread of Asiatic cholera, the Egyptian Maritime and Quarantine Sanitary Council has for 10 years made an annual report to the Permanent Committee of International Public Health at Paris as well as to the health authorities of all the countries interested in the pilgrimages to Medina and Mecca. This festival attracts some 100,000 worshippers. For 1936 the general health was satisfactory and there was an entire absence of infectious diseases. The absence of intestinal trouble is accounted for by the cooler weather. It is particularly interesting to note that this year, 105 people came by aeroplane, and it is

reported that there are indications that this mode of transportation will become more popular.

All of the pilgrims had to submit to vaccination against smallpox and double inoculation against cholera and typhoid fever. The countries of origin have been studied by the Regional Bureau of Sanitary Inspection for the Near East, and so have warnings of any sources of infection. There is coöperation in the carrying out of sanitary measures so that a pilgrim cannot obtain a passport unless he has a medical certificate from recognized authorities stating that he is free of disease. Ships carrying pilgrims are rigorously inspected and a report must be made on the structure of the vessel, accommodation, food, water supply, sanitation, and deratization. No pilgrims are allowed to supply their own food. Food is well prepared by the authorities and must be eaten under sanitary conditions. The camps have electric lighting, incineration, disinfectors, clean kitchens, and clean bedding. At Tor, 16,700 pilgrims were inspected, and examinations of blood, stools, and sputum of all suspected cases made.

This report applies only to the pilgrimage of Hedjaz, which is one of the most important, since it "has, for the last 81 years, been the post of relay of cholera in the rate of progress from the Far East towards the West."⁴

REFERENCES

1. Rogers and Megaw. *Tropical Medicine*, 1935.
2. Harrington, Charles, M.D. *A Manual of Practical Hygiene for Students, Physicians and Medical Officers*.
3. *Brit. M. J.*, Jan. 29, 1938.
4. *Manson's Tropical Diseases*, 1936.

PUBLIC HEALTH EDUCATION*

Education in a Cancer Program— One of the 5 main elements in the Massachusetts Cancer Program is education. Paragraphs describing the education phase of the program are taken from a talk by Eleanor J. Macdonald, epidemiologist of the State Department of Health. This talk was one of the many in which the state program is presented for local application.

In 1936 an order to disseminate knowledge concerning cancer did not suggest as precise a plan of action as a similar order would today. Every possible means of disseminating knowledge was immediately used. The radio, newspapers, and pamphlet distribution were all employed. There were large meetings held at central points to which famous authorities were invited to speak. These meetings were attended by hundreds of people who seemed to be enthusiastic. Although these general educational measures have certain intangible traits in common which make it difficult to measure their effectiveness, it was determined that some method of measuring the effect of these time-consuming educational projects must be evolved. At first, visits were made to physicians' offices in the territory surrounding the location used for one of the large meetings. The physicians were asked if there had been an influx of patients, especially of cancer patients, following one of these lectures, and if they thought that individuals were inspired by what they had heard to take some action. It was found by this means of evaluation that only the briefest flurry of interest was aroused by these meetings which took so much effort.

A second means of evaluating the effect of education became available with the passage of time. This was in the form of information that could be obtained from the cancer clinic records. After 8 years there were enough of these records to form a fair sample on which to base a sound study of the cancer educational situation in Massachusetts. Since

cancer, to be controlled, must be treated early, the most important measurement figure to watch is the average period of time that an individual waits after he knows that he has an abnormal symptom before he seeks medical advice. There is another figure that is very important from an educational point of view and that is the average length of time that individuals wait after they have been diagnosed by a physician before they put the recommended treatment into effect. It was found by this study; first, that there was not one individual who did not know he had symptoms of an abnormal nature for a considerable length of time before he sought attention; second, that the time individuals waited from the first appearance of this abnormal symptom until they sought medical attention had not been cut down by a fraction of a month and still averaged more than 6 months; third, that the period of time that individuals waited to put the prescribed treatment into effect after they were diagnosed by a physician was cut in half.

The one redeeming feature of this study indicated that the most promising way to control cancer in Massachusetts was through the family physician. So after the 8 years of usual methods of education, it was deemed wise to introduce a personal type of cancer education. Every individual would have to be given a chance to know exactly what was known and exactly what was not known about this disease. This exact knowledge precisely presented would give confidence which would in turn awaken realization of the need for prompt action.

In 1934, the Division of Adult Hygiene of the Massachusetts Department of Public Health began to organize every one of the more than 350 communities in Massachusetts into Coöperative Cancer Control Committees. Each community is studied first as an individual problem. The census figures reveal the various age groups, the various national groups, and the general population structure. The town directories list the clubs, churches, businesses, and industries. With this material thoroughly understood before the first contact is made, the original individual approaches the community with a fair idea of the size of the problem.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Ewart G. Routzahn, 130 East 22d St., New York, N. Y.

The surveyor contacts the board of health and in various ways finds out who the representative citizens in the community are. He has a meeting with these individuals, explains the plan in brief, and seeks advice as to what other individuals have the friendliest contacts in their own groups. Racial, social, fraternal, religious, labor, service, and all groups in the community are represented. The surveyor then has assistants to visit personally all these representatives. Their co-operation is sought, the plan is explained to them briefly, and they are asked to come to a formal organization gathering such as this meeting.

Assembled as we are here to determine how we may best face this problem together, we will again go into this plan. We want each one of you to go back to the group that you represent to ask them to have at least one meeting a year at which cancer is discussed and to which a local physician is invited to speak. The nature of the group determines the type of a talk. Some groups prefer a formal speech and others ask a physician to come in and answer questions. Whichever type of meeting your organization prefers is for them to decide, but in every case plan to have a question period. Do not feel that any question that any individual one of you wishes to ask will be taken lightly or will seem absurd. It has really been felt that the failure of large group meetings to accomplish their end is because their size precludes any possibility of a question period. It is through this question period that the greatest hope lies for controlling cancer. Every community has many of the same ideas. Each community usually has an idea peculiar to itself—"Does aluminum cause cancer?" "Do tomatoes cause cancer?" "Are there cancer streets?" "Is cancer contagious?" "Is it hereditary?" These are some of the questions that every community asks.

Some individuals have wondered what difference it made whether a person thought for example that tomatoes caused cancer. Individuals with cancer have often come to a physician's attention who had delayed beyond the hopeful stage because they thought tomatoes caused cancer and they had abstained from eating tomatoes. While they took an erroneous precaution they had been blind to the possibility of cancer developing in their case. This is one outstanding example, of which there are many, where true and false knowledge has made a difference between life and death.

This community is not being approached

while this plan is in the experimental phase. . . . Two hundred sixty communities have been organized. Many of the others are in the process of being organized. The meetings that have been held in this connection within the last 3 years have numbered thousands. There are approximately 4,000 individual committee members who keep in contact with the department all the time on this subject. The number of meetings being held each year varies all the way from more than 250 in Cambridge to the 3, representing the whole community, in Monroe Bridge.

In many places these small groups have their meetings, notify the central committee, who in turn notifies the department of public health without any prompting from the central committee. Other communities find that the individuals representing certain parts of the population have to make an occasional visit or call to the clubs in those groups to make sure that a meeting is held. Printed post cards with spaces to fill in the following information—the name of the club, the date of the meeting, the number present, the physician speaking, and any remarks which the group thinks would be of interest in the main office, have been placed with this committee. . . .

After every community in the state is organized, we are going to start all over again and see if we can reach those individuals who might have been missed in the first organization because they were not affiliated with any club or any group. . . .

The Income of the Audience—Family income, of course, affects much more than the status of medical care. It sets many factors which have to do with the acceptance and application of health instruction.

These paragraphs merely direct attention to the 3 year study of how American *native born* families make their living and spend their money. The study has been made by the Bureau of Labor Statistics, Dept. of Labor, and Bureau of Home Economics, Dept. of Agriculture, in 51 cities, 140 villages, and 64 farm counties. Some 285,000 families figure in the final returns.

Several pages of charts accompany an explanation of the study as reported in *Business Week*, 330 W. 42d St., New York, N. Y. April 9, 1938. 20 cents.

A "family" consisted of at least a husband and wife . . . who had been married at least a year . . . are living in housekeeping quarters . . . and were both born in the United States. The status of the foreign born was left for another study.

Of the families studied in cities of 200,000 to 300,000 population: 27.6 per cent were on relief or had less than \$1,000 annual income; 39.3 per cent between \$1,000 and \$2,000 income; 23.7 per cent between \$2,000 and \$3,000; 14.9 per cent had \$3,000 and over.

Of the families in cities of 30,000 to 70,000 the proportions were: 35.4 per cent under \$1,000; 39.8 per cent, \$1,000 to \$2,000; 16.2 per cent, \$2,000 to \$3,000; 8.6 per cent, \$3,000 and over.

These samples will suggest the significance of one phase of the study which was made primarily for use by business executives in laying out merchandizing plans.

The Uncounted Radio Audience— Much is said about the measurable radio audience. Broadcasting companies, research organizations, and radio followers submit a mass of more or less convincing data.

But *Business Week* (May 28, 1938) reviews the differences between the commonly accepted Crossley and Hooper reports, and the further differences by test check-ups made by a few advertisers.

B.W. quotes a leading commercial advertising director:

"We have not at the present time discovered the ideal method for gauging accurately what we buy when we buy radio, so far as circulation is concerned."

Business Week, 330 W. 42d St., New York, N. Y. 20 cents.

To Quote and To Be Quoted— We have urged that quotable material appears in monthly bulletins and else-

where. In response one editor has asked for suggestions.

The main idea is to note good stuff as it appears in various bulletins and other publications, and to help give it a larger audience—and make it do a bigger job. This has been the policy of several editors of state and local bulletins.

The companion big idea is to write something of your own now and then that other editors will wish to quote for the benefit of their readers. Needless to say, permission should be asked and credit given in every case.

"Where They Can Learn"— Under this heading *Business Week* (May 28, 1938) editorializes on the subject of public relations for business and industry. "Where they can learn" would be "a seminar or study group of not more than 15 or 20 searchers."

Public relations for health agencies calls for a similar approach. Health education on behalf of the organizations, as well as education in health practices of individuals and families could be furthered by such a group—or several groups.

The most experienced among us could jointly tackle some of the many perplexing problems. The experienced ones would be all the better equipped through such a procedure. The less experienced should be helped far beyond the expectations of pessimistic executives.

Not a 3 day institute with a crowded program, and competing distractions can serve the purpose. But a full week quite apart from any convention, and preferably away from a "big city." A week would be a modest minimum. A month would be all the better. However, several one week tests would show the way such a group might go.

Will executives and practitioners alike comment on this suggestion?

SPECIAL EDITIONS

The first of the new crop of newspaper health magazine supplements comes from New Haven, Conn. The "Better Health" edition of the *New Haven Sunday Register* is dated Feb. 27, 1938, and covers 36 pages. Among the features are a symbolic cover page; a page carrying facsimile letters from the Mayor of New Haven and the Governor of Connecticut, accompanied by portraits, and the Inter-Chamber City Health Conservation award to New Haven; the illustrated Diabetes Historical Landmarks (New York City Health Dept.); "Personal Health Aided by Books," by the Public Library readers' adviser; "Spider Web of Syphilis" (illustrated diagram); "The Medical Practitioners of Little Old New Haven" (sketches going back to 1645); "Old Time Nostrums Made It True, 'Cure Is Worse Than Kill'"; and so on. There are numerous illustrations, with some readable captions. For a copy send 10 cents to Paul H. Stevens, public information assistant, Health Department, New Haven.

Special health editions of Hertford County Herald and Jackson News of

Northampton are mentioned in North Carolina's state *Health Bulletin*. Local health officers participated in both cases.

Winston-Salem's *Journal and Sentinel* came out May 1, 1938, with a child welfare section of 8 standard pages. Numerous illustrations, nearly all being local scenes or subjects.

MAGAZINE ARTICLES

"Have They Died in Vain?" by H. Krieghbaum. *Survey Graphic*, 112 E. 19th St., New York, N. Y. May, 1938. 30 cents. Status of food and drug legislation. Letter from mother of a sulfanilamide victim as the appeal.

"Leaves from a Surgeon's Casebook," by James Harpole. (Stokes, New York). Condensed in *Book Digest*, 350 E. 22d St., Chicago, Ill. May, 1938. 25 cents. Records "the rapid progress which medical and surgical science has made."

"Medical Superstitions," by Dr. Morris Fishbein (a page of pictures); "150,000 Childbirth Tragedies" and what government is doing about it (4 picture pages). *Look*, Des Moines, Iowa. May 10, 1938. 10 cents. More nation-wide health education.

BOOKS AND REPORTS

Lectures on the Control of Syphilis and Other Infectious Diseases—
By Thorvald Madsen, M.D. Baltimore, Md.: Williams & Wilkins, 1937.
 216 pp. Price, \$3.00.

Dr. Madsen's book consists of 5 lectures given as the Abraham Flexner series for 1937 at Vanderbilt University. The series includes addresses on widely diversified subjects, and reflects the broad range of the author's learning and experience.

The first lecture deals with venereal disease control in Denmark, a topic already somewhat familiar to public health workers in this country. Treatment for syphilis by compulsion began in the 18th century in certain parts of Denmark and at its inception was strongly opposed. Later the public began to understand and with the co-operation of the clergy the necessity for syphilis treatment became recognized and accepted. Dr. Madsen believes that the underlying factor in the relatively satisfactory condition in Denmark as far as venereal diseases are concerned is expedient and adequate legislation that gives easy access to free treatment. The present excellent facilities for diagnosing and treating syphilis at public expense are described. The reproduction of the serological test record of a Danish patient will be of special interest to those engaged in syphilis control.

The "Mechanism of Bacterial Infection" is the subject of the second lecture. Numerous experiments at the Danish State Serum Institute are reviewed, most of them involving the administration of organisms of the salmonella group to animals and tracing the course of the bacteria administered

by means of pathological and bacteriological examinations at stated intervals after the initial dose. Besides organisms of the salmonella group, *B. abortus* and the tubercle bacillus were used. The studies make it appear that when organisms are given by mouth the route of infection is always the same. Direct infection of the blood stream from the intestinal tract has never been demonstrated. Organisms pass from the intestinal tract to the regional lymph glands, and thence through the lymphatics to the thoracic duct, and to certain organs, particularly the liver and spleen. Organisms reach the blood stream through lymphatic channels, and in many infections the presence or absence of bacteremia seems to depend upon phagocytosis, especially in the liver and spleen, rather than upon any bactericidal powers of the blood.

According to Dr. Madsen's third lecture, the cost can never keep a tuberculosis patient in Denmark from being treated properly. There are two sanatorium beds for each annual death, adequate diagnostic facilities, and facilities for extramural X-ray and pneumothorax services. Americans who realize the social and economic implications of tuberculosis will appreciate the provisions of Denmark Social Care Acts. These laws provide for giving needy tuberculosis patients and their families full maintenance during the first 3 months after the discharge of the patient from a sanatorium.

Dr. Madsen gives the results of tuberculin testing in various localities, and of experimental studies of the same nature. There are many authorities who would not agree with his statement that "it seems an established fact that,

except cases of a quite new infection, the tuberculin-positive are better protected against subsequent infections than the tuberculin negative." Also, many health officials may question Dr. Madsen's belief that there are good reasons for advocating vaccination by the Calmette-Guerin method.

"All born in northern climates can speak of the effects of the yearly change on our condition and from antiquity months of the year have been associated with diseases." Dr. Madsen in this fashion takes cognizance of common experience in his lecture on the influence of seasons on infection. He then cites numerous examples of seasonal distributions of disease. Taken for the most part from the unusually complete Danish morbidity records, these examples are striking in that they include seasonal distributions for such diseases as gastric ulcer, impetigo, erythema multiforme, and other conditions for which occurrence by months is seldom recorded. Dr. Madsen reviews experimental observations on the possible relationship of light, vitamin deficiency and other factors to seasonal distribution, and closes his lecture with emphasizing the fact that the health officer must be familiar with seasonal fluctuations in his own community. He must also determine the cause of an unusual rise of any disease out of season.

The last lecture is on whooping cough. Statistical data from several countries are presented to show that whooping cough is one of the most fatal of the acute infections of children. In spite of this, it is assuring that the trend of mortality has been downward over a period of years in most countries. As shown by data from many localities, the proportion of older children surveyed who give histories of whooping cough is very large. The disease causes much loss in absence from school and may be followed by physical

and psychic troubles of long duration.

Dr. Madsen accepts Bordet-Gengou bacillus as the cause of whooping cough, and states that facilities for diagnosis by the cough plate method have been established at the Serum Institute. On the basis of frequent cultures during illness, it has been found that organisms are few by the 4th week after the first paroxysm, and it is considered safe to readmit children to school on this basis. During experiments with whooping cough vaccine on the Faroe Islands, the mortality in the vaccinated group was one-sixteenth that of the unvaccinated, and cases among the vaccinated were mild and of short duration. Whether these results were due to specific immunity, or to nonspecific immunity lasting only a few weeks after injection was not decided.

GEORGE H. RAMSEY

Milk Control: Governmental Regulation of the Dairy Industry in the United States—*Prepared and published by the American Municipal Association. Chicago, 1937. 49 pp. Price, \$.75.*

The principal steps taken by federal, state, and local authorities to regulate this important industry for consumer protection are reviewed and the developments necessary further to purify milk in every section of the country are examined and explained. Four out of every five communities with population over 1,000 to 10,000 do not regulate the conditions of production or distribution of milk. Less than 40 per cent of the milk consumed in such communities is pasteurized and little or no attempt is being made to urge producers to pasteurize milk before they use it in their own homes. With bovine tuberculosis practically eliminated, Bang's disease in cattle (one of the causes of undulant or Malta fever) and mastitis (which causes the secretion of abnormal milk) still need to be brought

under control. More accurate reporting of milk-borne infections is needed. Under our system of state and local government, milk regulations naturally are not uniform throughout the United States, and this lack of uniformity continually offers reason to those who believe in efficient government from above to urge federal and state regulations. The general approach used in this review is one that supports federal and state control with consequent suppression of municipal and community initiative.

This pamphlet discusses in some detail the attempt to standardize regulations through the use of the model milk control ordinance which has been developed since 1923. It states that many communities have adopted the model ordinance, but does not point out the fact that this type of standardization may be carried out in such a way as to repress new developments. The review also fails to call attention to the fact that communities, e.g., New York City, that have efficient milk control based on other types of regulation do not receive recognition for their work in the published records issued by the federal authorities urging the model milk ordinance.

Little recognition is given in this pamphlet of the fact that the enforcement of any ordinance designed to control the quality of the dairy products should be based on a laboratory examination of the product whose quality is to be controlled as well as an inspection of the sources of supply and processing plants. Thus, there is only incidental mention of the report on *Standard Methods of Milk Analysis* which has been developed under the auspices of the American Public Health Association.

Nevertheless, the pamphlet issued by the American Municipal Association summarizes so much information of value that everyone interested in the

important question of the sanitary quality of our dairy products should have a copy. ROBERT S. BREED

Health Section Report, World Federation of Education Associations—*Seventh Biennial Conference, Tokyo, Japan, August, 1937. Available from the Health Section Secretariat, 200 Fifth Ave., New York, N. Y. Price, \$1.00.*

This report gives the proceedings of the conference held in Tokyo in August. Dr. C. E. Turner, Chairman of the Health Section, and Sally Lucas Jean, Secretary, planned a program to which representatives of 15 nations were welcomed. Present membership in the section consists of 200 groups in 26 countries. Health information is sent by regional correspondents to the secretary in New York. From here it is disseminated in answer to inquiries from other countries. Dr. Turner emphasizes the fact that the section is not interested in standardization, but in learning the best experience of all countries and helping its members to benefit therefrom.

The report is very interesting and readable. Perhaps its most important lesson for us is that there are "many ways to skin a cat" in public health work. It is well for us to bear this in mind since we are often inclined to be intolerant of others whose methods differ from our own but whose results eventually are as good. Discouraged rural public health workers in this country may take heart from reading the reports from Punjab and from Egypt. Self-satisfied health workers may find new worlds to conquer by reading the reports from Hawaii, the Philippines, and Japan. The Chinese delegate reports a number of inherent obstacles in his country, among them the fact that medical education in China has been taken from overseas and most teachers in medical schools

do not see the relation between education and keeping healthy. Where have we heard that before?

It is evident that the educational abilities of the public health nurse are being recognized and utilized in other countries as well as our own. With the exception of Japan, each country reporting speaks highly of her values. It is also evident that the United States is not unique in befogging the public health field with many activities only indirectly related to health. Thus, the papers contain discussions of gymnasia, sports, military training, morals, baby contests, community singing, religion, and philosophy. Many countries appear to be farther advanced in attention to teachers' health than this country. One searches through the report in vain for definite proof that the elementary school health program is resulting in lessening the incidence of physical defects among college students and those entering industry. The Junior Red Cross appears to be a potent influence in health matters in many countries.

Teacher training, physical education, special schools, the part of the physician, the nurse, and the teacher, the relationship of the home and school, sight protection, dental health education and service, and physical examination of college students are discussed at length. This volume should be of interest to public health and school personnel. It should inspire readers with a renewed desire to help improve the health of children whatever their nationality.

W. P. SHEPARD

The Foundations of Nutrition—
By Mary Swartz Rose (3rd ed.) New York: Macmillan, 1938. 625 pp. Price. \$3.50.

This is a welcome revision of a much used text in college courses in nutrition. The organization is fundamentally the same as in the earlier editions, but each

topic has been rewritten in the light of recent discoveries in the field, and all tables have been revised.

The subject matter is selected and presented for those who wish to gain a knowledge of the significance of food so that they may "live more intelligently." In the 26 chapters the author presents very simply and clearly some of the basic principles of human nutrition and makes practical application of these principles to the feeding of individuals or groups of individuals. Special attention is given to the discussion of dietary essentials—energy, protein, the ash constituents, vitamins, and water; of the contributions to the diet of various types of food materials; and of the construction of adequate diets. The appendix comprises 9 compact tables which include height-weight-age tables for children and adults; detailed information on the energy cost of activities; plans for constructing adequate diets for persons of various ages and conditions; and data on the nutritive value of food in terms of "shares." From these tables the nutritive value of any diet can be calculated easily.

The discussion of energy, including the need of the body for energy, the energy requirement of adults and children, the methods of measuring energy production, and the effects of a shortage or a surplus of calories, has been little changed. The results of recent researches have been incorporated in the discussion of proteins, vitamins, and minerals. Liberal use is made of photographs, tables, and charts to illustrate and emphasize the points under consideration.

Having presented the fundamental facts concerning the dietary essentials, the author points out the contributions of these factors made by the different foods. The foods are grouped on the basis of their similarity in nutritive properties. These groups serve as a

foundation for the planning of diets to meet the daily requirements. The construction of adequate diets for children of various ages, for adults of different occupational groups, for families on different income levels, and for the mother and baby are given careful consideration.

In its revision the book has lost nothing and has gained much that is of value. Subject matter, tables, dietaries, and references have been brought up to date and much new illustrative material has been added.

VIRGINIA BATIE WHITE

Standard Business Etiquette—By *J. George Frederick*. New York: *Business Bourse*, 1937. 188 pp. Price, \$1.75.

Executives and staff members are concerned with how to do things together—how to get things done through right personal relations. To that end we have this book presenting "personal codes for smooth-running organization efficiency."

There are chapters on being "business-like," on using the telephone, on conferences, and chapters for private secretaries, for reception clerks, and for executives and employers. Any one of these chapters makes the book worth the price to a health agency. They are practical and "business-like."

The book first claimed our interest through the chapter on the business conference, in view of many weary hours spent "in conference." Addressed to business groups, yet largely this chapter is applicable to health agencies. Studied and practised, these 14 pages would help to make staff conferences interesting, and actually an important factor in administration. And the 25 rules with comment should retrieve countless conference-hours now grimly endured without hope of fruitful results.

At least take a chance, and ask the publisher to send a copy on approval.

EVART G. ROUTZAHN

Dairy Bacteriology—By *B. W. Hammer, B.S., M.S., Ph.D.* (2nd ed.) New York: *Wiley*, 1938. 482 pp. Price, \$5.00.

The author is eminently qualified by experience, accomplishments, and insight to write a book on dairy bacteriology. In this revised edition the newer phases of dairy bacteriology have been incorporated and the book brought up to date in every respect. He again emphasizes the fermentations taking place in milk and its derivatives, since an understanding of these is essential not only to the student and the practical bacteriologist but to any one responsible for the quality of dairy products. Material selected from the leading dairy bacteriology departments in the country makes the book a source of valuable information.

Beginning with the fundamental chapters on bacterial determinations of milk and milk fermentations, there is a comprehensive and authoritative discussion which leaves in the mind of the reader a picture of the difficulties met with in the manufacture of dairy products of high quality. The basic facts underlying the practice of such production are clearly presented.

The chapters on contamination of milk and cream and its control, and the destruction of microorganisms are particularly well presented. The book is not a mass of theory on controversial subjects but of technical and practical knowledge usable by those responsible for the quality of milk and milk products.

The make-up and printing are excellent. The first edition at once took its place as a standard. This second edition maintains the high character of the original and the book will doubt-

less keep its place as one of the most authoritative and useful in its field.

R. G. McCARTY

Fit To Teach: A Study of the Health Problems of Teachers—Ninth Year Book, Department of Classroom Teachers, National Education Association, Washington, D. C., 1938. 276 pp. Paper. Price, \$1.00.

Here is a report, with interpretation and the application of the data, along with a health manual for the classroom teacher. The basic material is drawn from 5,000 questionnaires from classroom teachers, and several hundred from school physicians, superintendents, principals, and teachers' associations.

A chapter asking if teachers are healthy (reviews the nature of teachers' health disorders) is followed by the personal health practices of teachers (the diet section being prepared by Mary S. Rose and Clara M. Taylor). The mental health and the spiritual health of teachers, and the school environment are presented. Factors outside the school, and community responsibility in the promotion of teacher health are discussed. Considerable importance is attached to health promotion by teachers' professional organizations, and in the pre-service training of teachers. Good health as a prerequisite for certification, and as a factor in employing teachers, is emphasized.

The questionnaires, duplicated in the appendix, might well be used in further local studies, and as checklists for administrators and individual teachers. Civic and health workers concerned with the health of teachers and health teaching by teachers cannot afford to overlook this volume.

EVART G. ROUTZAHN

Let's Grow and Let's Stay Well—By Mary L. Hahn and Charles-Edward Amory Winslow, Dr.P.H. New York:

Merrill, 1938. 186 and 184 pp. Price, \$.72 each.

Let's Grow and *Let's Stay Well* are the Third and Fourth grade books, respectively, of the New Healthy Living Series by these authors. They are designed to meet the major objectives of health instruction in these two grades. The type used is easy on the eyes. The chapters average 8 pages each. The material used aims at maintaining real child interest in the true-to-life experiences of the children in the books. The health program presented is definite and complete. Emphasis is placed upon good health rather than upon sickness.

W. W. PETER

Health—By C. E. Turner, Dr.P.H., Sc.D., and Georgie B. Collins. Boston: Heath, 1937. 231 pp. Price, \$.72.

Cleanliness and Health—By C. E. Turner, Dr.P.H., Sc.D., and Georgie B. Collins. Boston: Heath, 1937. 236 pp. Price, \$.80.

According to the publisher's blurb there are "one hundred forty-six health habits, fundamental to physical and mental health"—a number sufficient to stimulate many authors to writing text or guide books for teachers who otherwise might omit stressing some or get all confused.

Both of these books are revisions. *Health* for grade V and *Cleanliness and Health* for grade VI. The method followed by the authors is quite in contrast to *Let's Grow* and *Let's Stay Well* by Hahn and Winslow. The former books might be edited stenographic records of interesting health talks; the latter employ dialogue chiefly.

W. W. PETER

Intensive Rural Hygiene Work in Netherlands India—Public Health Service of Netherlands India, Batavia, Java, 1937. 170 pp., 143 ill.

This book is much more than a de-

lightful report of outstanding public health work; it is a philosophy of public health expressed in terms of successful experience. From a recent visit to Java, the reviewer can certify that the accomplishment and philosophy expressed are fully borne out in the splendid work being carried forward by the Dutch Colonial Service.

The intensive rural hygiene work described is essentially a program of sound, practical, constructive health education applied to rural sanitation, and especially to hookworm control. It is succeeding much better than did sanitary ordinances or curative medicine. The philosophy, or point of view, upon which it is based may best be expressed by a few selected sentences from the book itself:

An attempt to carry out hygienic measures by beginning with the use of force gives rise to active and passive resistance . . . Medical care can be carried out by a central government organization, a local government organization, a society et cetera, but it should not be included in the program of a public health service . . . The teaching of hygiene cannot be based efficiently upon medical care, but should be based upon educational measures . . . Medical care and hygiene work concern such different fields of activity that for efficient work there should be a different subordinate personnel for each field wherever this is possible . . . Those who have once worked with activities that concern medical care will not willingly give up this attractive care of the sick which is satisfying to them to carry on hygiene work which is much more difficult and the results of which cannot be seen immediately, but will be secured much later. For this reason pure hygiene work is nearly always postponed. Medical care is much easier than hygiene work, it is more attractive, the results are immediately seen, the patients come to the doctor, and everything runs more smoothly than with hygiene work . . . The people must seek their health not in clinics or hospitals, but must try to find it in hygienic habits and hygienic surroundings.

Detailed descriptions of the health education procedures are presented and the plentiful illustrations charmingly depict the health education methods and

also the habits, problems, living conditions, and accomplishments of the Javanese villagers.

The delegates from Indo-China at the recent Rural Hygiene Conference in Bandoeng were so impressed with this work that the book is now being translated into French.

Every health educator and every health officer would be challenged and stimulated by this book. Inquiry has revealed that there are a few hundred copies of this report still available to professional workers who are really interested in the problem. Requests should be sent to the Director of the Public Health Service of Netherlands India, (Dienst der Volksgezondheid) Parapattan 10, Batavia-Centrum, Java, N. I.

C. E. TURNER

Tuberculosis Among Children and Young Adults—By J. Arthur Myers, Ph.D., M.D. (2nd ed.) Springfield, Ill.: Thomas, 1938. 401 pp., 71 ill. Price, \$4.50.

The first edition of this book appeared in 1930 and now, 8 years later, the author has drawn on his added, rich experience and the multitudinous, valuable contributions that have been made to the literature on the subject of tuberculosis among children and young adults to bring together into one compact volume the latest information on the diagnosis, treatment, and prevention of the reinfection type of pulmonary tuberculosis.

Beginning with an account of the results of recent research in the field of tuberculosis control, including Purified Protein Derivatives, X-ray, Sedimentation Rate, Animal Experimentation, Epidemiology, Sociological considerations, sanatorium treatment, etc., the author then devotes a chapter to sensitization and immunity, discussing the effects of sensitization, the detection of sensitiveness, the dangers of a high degree of sensitization and the

significance of the negative tuberculin reaction in persons who have been exposed to an open case of tuberculosis for a comparatively long period of time.

Concerning immunity to tuberculosis Dr. Myers summarizes the 6 pages of discussion as follows:

Attempts to produce immunity in various animal species have brought about a wide range of results. Therefore, it does not appear safe to draw conclusions concerning the immunizing effect of tuberculous infection in man from the results obtained in any one animal species. The incidence of disease in the various races is not an index to immunity. The best test of the immunizing effect of the first infection type of tuberculosis is made by observing what actually happens among groups of children who have developed this type of disease. Wherever such observations have been made over a sufficiently long period of time, the results are very discouraging to those who would like to depend upon immunity for protection against clinical tuberculosis.

Tuberculosis in Infancy, Tuberculosis in Childhood, and Tuberculosis Among Young Adults, are the principal subdivisions of the book. The chapters have been prepared carefully and with an eye to an orderly presentation of the facts. Contributing authors have written the chapters on Tuberculous Meningitis, Tuberculous Disease of the Bones and Joints, and Chronic Non-tuberculous Basal Pulmonary Diseases in Childhood.

Especially valuable are the summary and bibliography at the end of each chapter. No effort has been spared in presenting as exhaustive a compilation of modern references as possible, and this feature should make the volume an important addition to the technical libraries of all persons interested in tuberculosis in children and youth. The index is unusually complete.

BERNARD S. COLEMAN

Pulmonary Tuberculosis in Practice—By R. C. Wingfield, B.A., M.C., B.Ch., F.R.C.P. Baltimore: Wood, 1937. 122 pp. Price, \$2.50.

This book, as we are told in its preface, is intended

... to bridge the gap between the practitioner and the specialist. An attempt to show the senior student and the young practitioner that if he will approach tuberculosis from a new and simpler angle he can study the disease in his practice and that with only a broad knowledge of those parts of the diagnosis, assessment and treatment, that must of necessity call for the specialist's skill, he can really take a hand in the treatment of his cases and need no longer drop them like hot coals as soon as they are diagnosed.

The author has undoubtedly had broad experience in the management of tuberculosis and the present volume is a direct result of his intimate acquaintance with actual needs of practitioners with whom he has had contact. The text is most interestingly presented; the arrangement of the material follows closely and in careful detail the train of events along their various courses from the primary tubercle to complete healing or to massive cavitation. The chief diagnostic aid is the roentgenogram. The method of classifying lesions is the author's own; in America we cannot feel this to be superior to the classification of the American Association. His idea that allergy is not a manifestation of immunity will probably be changed as he studies this part of the problem more closely. We cannot agree that an ischio-rectal abscess should ever be poulticed and think the book would have made more friends if this section had been omitted.

These comments are trivial compared with the wealth of information this volume contains. Anyone concerned with the clinical management of pulmonary tuberculosis will find it profitable and interesting reading. It is profusely illustrated with cuts made from roentgen ray pictures and especially by a large chart showing graphically the important stages in the development of tuberculous lesions of the lung.

Supplementary chapters discuss: "The Mantoux Reaction" (apparently the author does not know about P.P.D.), "Haemoptysis," "Pleural Effusion," "Ischio-Rectal Abscess," "Spontaneous Pneumothorax" and "Tuberculous Laryngitis."

A. P. HITCHENS

Fifty Years a Country Doctor—
By William N. Macartney. New York: Dutton, 1938. 584 pp. Price, \$3.50.

Only the other day I was reading an article of the kind now all too common, dwelling on specialism in medicine as well as in doctors, and claiming that the family doctor had passed from the picture, leaving would-be patients confused and unhappy.

The first page of this excellent book combats the idea that the general practitioner is passing or has passed and that the day of the specialist has arrived. It claims that two-thirds to three-fourths of the population are still treated by their family physicians and says, "The species is a long way from extinction; they are a hardy breed and will survive." There is no doubt that many people will be glad to know this. Certainly we owe more to the country doctor than we can ever repay. It is well to remember that Marion Sims, McDowell, Drake, and a host of others who have added much to our medical history were country doctors.

The book before us is extremely interesting, a good story of a useful life, well written by the best type of country doctor. Autobiographies are always interesting when they are sincere. The story of Dr. Macartney is not only sincere but is filled with a kindly philosophy tempered by a shrewdness evidently due to the Scotch-Irish descent which he claims. Further than this, it gives us a picture of a number of the great men whose names are household words in American medicine, such as Loomis, Draper, Witthaus, Gaillard

Thomas, Austin Flint, Sr., Phelps—and perhaps of greatest interest to the readers of this *Journal*—Stephen Smith, the founder of our Association.

Almost every page gives some amusing incident, many of which are credited to certain characters who are perhaps more or less composite but who the author assures us actually were friends of his. We are quite prepared to see some of these—Uncle Eph, Si Perkins as well as Si Perkins's wife, and Dr. Jenkins—become well known characters.

We commend this book heartily from every standpoint, and hope for a long survival of the type of country doctor illustrated in the life of the author.

MAZÏCK P. RAVENEL

Personnel Policies in Public Health Nursing—
By Marian G. Randall. New York: Macmillan, 1937. 170 pp. Price, \$2.00.

This book should be in the hands of every public health administrator, director of nursing bureau, and director of a public health nursing agency. The material discussed is based on a study made of personnel practices in 59 official agencies. Every chapter is full of meat for those interesting in improving personnel and the conditions which make for their well-being.

The author throws out a challenge in the introduction by stating: "At present the need for *qualified personnel* is still the *major administrative problem* of public health." Later she says "standards are maintained and improved by the efforts *from within the profession* or group." This follows the recommendation that a nursing advisory committee be appointed in each community to assist the Civil Service Commission in setting up standards, etc.

The most encouraging item in the book is the comparison of the preparation of public health nurses in official agencies today with that of those in-

cluded in the study made by the National Organization for Public Health Nursing 6 years ago. In addition to the tables giving this comparison, the author points out that approximately two-thirds of all directors and one-third of all supervisors have college degrees; nearly three-fourths of the directors and over three-fourths of the supervisors have public health nursing certificates, and the percentage of field staff having certificates has more than doubled in 6 years.

What is not generally understood by many boards and some officials is the fact that staff nurses working without supervision need more academic and professional experience—not less—than those with supervision. This study indicates for the total group that the higher salaries paid to public health nurses are in direct relation to higher education, both professional and academic. Several health officers and nursing directors said they would like to have salaries based on efficiency but had not devised a practical method of putting this into effect because of rating difficulties. It is encouraging that there is a trend toward increasing the probationary period used in many agencies from 3 months to 6 months, and the recommendation is made that where possible, a year be considered.

An important point brought out in connection with dismissal policies is that careful records of work and reports of agencies should be made out periodically for every nurse on the staff. These reports should also show that the records have been discussed with the nurse. In connection with the promotion policies, although length of service is the usual basis upon which promotions are made, it is generally agreed that an objective rating of services and promotion based on efficiency are more satisfactory to both the organization and the worker.

Excellent data have been made available

in regard to health examinations, citizenship, age, personality, hours of work, vacations, leaves of absence, retirement, pensions, and insurance. In fact, this book based upon a field study of personnel practices in various parts of the country is full of valuable information for the administrator in public health nursing, and its recommendations, presented in the fore part of the book, are a challenge to us all.

MARGUERITE WALES

Methods of Analysis for the Butter Industry—*Edited by J. C. Fridenberg.* Chicago: American Butter Institute, 1937. 48 pp. Price, \$1.00.

A laboratory manual is of value only in so far as its procedures are accurate, reasonably simple, and relatively inexpensive to conduct. This loose-leaf booklet adequately satisfies these conditions not only for the butter industry but also for food and dairy inspectors, laboratory workers, and even consumers.

The book is divided into 10 sections, each devoted to a phase of analysis. In addition to notes on sampling and methods for the determination of quality and composition of butter, the manual contains fat, sediment, and acidity tests for milk, skim milk, and cream. One section is devoted to the determination of diacetyl and acetylmethylcarbinol (the flavor factors) in butter and butter starters. A practical method for determining the keeping quality of butter is also presented. The last section of the book outlines methods for checking those acidity and salt test solutions which are subject to variation. An ever useful temperature conversion table is also included.

The methods outlined in this manual are those which are used by the American Butter Institute's Laboratory and may well be considered sufficiently accurate and simple for most routine semi-official butter tests.

C. R. FELLEIS

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Measles Statistics—Current measles incidence is the highest on record, but it is declining. Highest incidences were reported in the east, north central, and east south central regions, where the disease was more than 4 times the seasonal expectancy. Useful graphs.

ANON. Prevalence of Communicable Diseases in the United States. *Pub. Health Rep.* 53, 19:747 (May 13), 1938.

For Hot Weather Vaccinations—Research is reported which leads to the recommendation that vaccine virus propagated on chick membrane be dried, ground, and diluted with serum to make it resistant to the heat ordinarily encountered in hot weather, which so often inactivates ordinary saline diluted virus.

BUDDINGH, G. J. The Use of Serum as a Protective Diluent for Vaccinia Virus. *Am. J. Hyg.* 27, 3:530 (May), 1938.

The Slaughter of the Tonsils—Among 8,758 white families in 18 states, a surgical operation rate of 65 operations per 1,000 persons per year was reported. Highest rates were found in the 5-9 and 30-34 year age groups, the first for tonsillectomies, the second for female genital and puerperal conditions. Tonsillectomy accounts for a third of all operations, setting fractures stands second, and appendectomy third. Significant sex differences in various operations are recorded.

COLLINS, S. D. Frequency of Surgical Procedures Among 9,000 Families, Based on Nation-wide Periodic Canvasses, 1928-1931. *Pub. Health Rep.* 53, 16:587 (Apr. 22), 1938 (or) *Milbank Quart.* 16, 2:123 (Apr.), 1938.

Some Meditations on Tuberculosis—In New England female tuberculosis death rates exceeded the male until about the end of the last century: since that time the male rates have been in excess. In the South, mortality has been consistently higher among men. Whatever has affected the rate among young children has affected each sex about equally. The more rapid decline among adult females may be due to the fact that women being largely employed in household duties have responded more quickly to better living conditions than their husbands.

DAUER, C. C. Sex Differences in Trends of Tuberculosis Mortality. *Am. J. Hyg.* 27, 3:538 (May), 1938.

Frequency of Disabilities—Over a 5 year period disabling illnesses and non-industrial accidents of 8 or more days' duration occurring in a large group of white male employees were recorded. The annual rate per 1,000 was 132 (when adjusted for age, 124). In this study you will find some important records of duration of illness, incidence, distribution, etc.

GAFNER, W. M. Frequency of Sickness and Non-Industrial Accidents Causing Disability Lasting Eight Calendar Days or Longer Among 60,000 White Male Railroad Employees, 1930-1934 Inclusive. *Pub. Health Rep.* 53, 15:555 (Apr. 15), 1938.

Disulfide Poisoning—To the list of industrial health hazards must be added carbon disulfide poisoning. Viscose plants manufacturing rayon use the chemical, as do some rubber manufacturers. As a minimal standard of

safety an atmospheric concentration of 10 p.p.m. is suggested.

GORDY, S. T., and TRUMPER, M. Carbon Disulfide Poisoning. J.A.M.A. 110, 19: 1543 (May 7), 1938.

For V. D. Clinicians—British findings that sulfanilamide will clear up chancroid quickly.

HANSCHALL, H. M. Sulfanilamide in the Treatment of Chancroid. Lancet. 1, 16:886 (Apr. 16), 1938.

Brucellosis Incubation Periods—Most observations of the incubation period of undulant fever have indicated 14 days as the usual, with 3 to 20 days as the extreme limits. Experimentally induced infections increased the limits to 28 to 35 days. Study of 17 city cases infected by drinking contaminated milk in the country reveals incubation periods of from 1 week to not less than 4 months.

HARDY, A. V., *et al.* The Incubation Period of Undulant Fever. Pub. Health Rep. 53, 20:796 (May 20), 1938.

Whooping Cough Prophylaxis—One dose of alum-precipitated pertussis vaccine was given to a group of children. A control group and the treated children were watched for a year. Reactions following immunizations were negligible. Fewer cases of whooping cough occurred among the treated than the control children and attacks were milder. The experience indicates that larger doses of the antigen should be tried.

HARRISON, W. T., *et al.* Prophylactic Value of a Single Dose of Precipitated Pertussis Vaccine. Pub. Health Rep. 53, 20:793 (May 20), 1938.

Better Measles Prophylaxis—Globulins recovered from adult serum proved effective in preventing development of measles in exposed children. The prophylactic is urged for further trial, for it produced no reactions, the amount to be injected is small, and the supply unlimited.

KARELITZ, S. Prophylaxis Against Measles With the Globulin Fraction of Immune Human Adult Serum. Am. J. Dis. Child. 55, 4:768 (Apr.), 1938.

Starting from Scratch against Polio—How little we know about the cause, treatment, and prevention of poliomyelitis is told with openmindedness and with complete frankness. Especially in preventive knowledge are we woefully wanting.

LUMSDEN, L. L. Poliomyelitis: Facts and Fallacies. South. M. J. 31, 5:465 (May), 1938.

Decibels and Deafness—Excessive noise impairs the efficiency of workers by affecting hearing, producing fatigue and neuroses, and interfering with sleep. Noise can be measured and rough standards of safety established. Air conditioning tends to reduce outside noises, some inside noises may be eliminated at the source, and there are measures by which the individual may protect himself.

McCORN, C. P., *et al.* Noise and Its Effect on Human Beings. J.A.M.A. 110, 19:1553 (May 7), 1938.

Fertile Families—In the 1930 census, questions were asked about children under ten years in each home. While the findings do not indicate the birth rate, they do reveal some interesting comparisons: fertility is inversely related to community size; negroes have lower average fertility than whites (though those negro women who have any children have more); in general, fertility and economic status are inversely related, with the exception of the highest value-of-home groups.

NOTESTLIN, F. W. Differential Fertility in the East North Central States. Milbank Quart. 16, 2:173 (Apr.), 1938.

All That Can Be Told About Colds—Excellent summarizing the best available present-day information about colds, the author begins with the

warning that in the pamphlet will be found nothing new or startling, and no revolutionary ideas about the cause, prevention, or treatment.

OLESSEN, R. Common Colds. *Pub. Health Rep. Supplement No. 135* (May), 1938.

Three Generations of Rheumatism

—Studies of the history of rheumatic infection among relatives of children with rheumatic disease and relatives of a control group of children revealed a high frequency among the relatives of the infected children and a low frequency among the others. These findings, indicative of a familial tendency to the disease, suggest a constitutional susceptibility, but cannot eliminate exposure as the important factor. More study is suggested.

READ, F. E. M., *et al.* The Frequency of Rheumatic Manifestations Among the Siblings, Parents, Uncles, Aunts, and Grandparents of Rheumatic and Control Patients. *Am. J. Hyg.* 27, 3:719 (May), 1938.

Baby's Habits—Written for nurses, but there is much here of interest to all health workers. There are recognized behavior patterns of each age level: when they are not reached it is a sign something is wrong. With sufficient outside pressure a degree of conformity to expected behavior patterns may sometimes be obtained, but this may not be desirable. We are learning now that rigid schedules may not be best; how much individual freedom to allow is the problem.

ROBERTS, D. I. Changing Concepts of Child Training. *Pub. Health Nurs.* 30, 5:283 (May), 1938.

Children Lose Immunity—An apparent increase in diphtheria among supposedly immunized children leads these authors to recommend that children treated in infancy be tested and immunized again if necessary when entering school.

SCHWARTZ, A. B., and JANNEY, F. E. The Need of Redetermining Schick Negativeness

in School Children. *J.A.M.A.* 110, 21:1743 (May 21), 1938.

New Public Health Objectives—

Repeat this mouthful to yourself: any disease or condition causing widespread morbidity, about which existing scientific knowledge, if applied, would prevent, cure, or alleviate, but is not applied for some reason, is a public health problem. When that has sunk in, you have a starting point for a profound public health discussion, of which this is an excellent example.

SINAI, N. Health As a National Asset. *Pub. Health Nurs.* 30, 5:287 (May), 1938.

The Grim Reaper's Stealth—

In childhood, healthy growth and the progress of disease are easily distinguished because both show vigorous change; infirmity in childhood is not so easily recognized. In maturity changes due to aging are slow and not easily noticed, and infirmity may be confused with aging, which is a process of adaptation in structure and function. Criteria of healthy aging are not clear-cut; resilience is lessened, speed of reaction is curtailed, staying power is diminished, but portents of disaster are similar throughout life.

TODD, T. W. Aging Versus Infirmity. *Sci. Month.* June, 1938, p. 545.

Some Lives That Should Be Saved

—Excess of deaths among males over females is highest in the "prime of life" and at this age the excess has been mounting steadily. Incidentally, it is higher in the United States than in Canada and other countries, so there must be some other than a biological factor responsible. The excess of male deaths in the 25-44 year group is important because such deaths should be postponable, and they occur at the time of greatest economic usefulness of the men.

WIEHL, D. G. Sex Differences in Mortality in the United States. *Milbank Quart.* 16, 2:145 (Apr.), 1938.

"Bachelor Scurvy" and Other Disorders—Three useful lectures on nutritional deficiencies and deficiency diseases beginning with a thought provoking quotation to the effect that the best fed people nowadays, though get-

ting twice as much vitamin B as those on low incomes, consume less vitamin B than the parish poor in the early 19th century.

UNGLEY, C. C. Some Deficiencies of Nutrition. *Lancet*. 1, 16:875 (Apr. 16), 1938.

BOOKS RECEIVED

SEWERAGE AND SEWAGE TREATMENT. By W. A. Hardenbergh. Scranton: International Textbook Co., 1938. 396 pp. Price, \$3.50.

HONEY AND HEALTH. By Bodog F. Beck. New York: McBride, 1938. 272 pp. Price, \$3.00.

LES EPIDEMIES ET L'HISTOIRE. By Albert Colnat. Paris: Editions Hippocrate, LeFrancis, 1937. 191 pp. Price, \$1.35.

MORE OF MY LIFE. By Andrea Majocchi. New York: Knight, 1938. 313 pp. Price, \$2.50.

THE DIAGNOSIS OF SYPHILIS BY THE GENERAL PRACTITIONER. By Joseph Earle Moore. Government Printing Office, 1938. Price, \$1.10.

THE RADIOLOGY OF PULMONARY TUBERCULOSIS. By J. E. Bannen. Baltimore: Wood, 1937. 156 pp. Price, \$4.50.

THE CHALLENGE OF TUBERCULOSIS. Addresses Presented at the Annual Luncheon Conference of the New York Tuberculosis and Health Association, March 1, 1938. New York: New York Tuberculosis and Health Association, 1938. 26 pp.

DIPHTHERIA MORTALITY AND MORBIDITY IN PITTSBURGH. By Mildred Stahl Fletcher. Pittsburgh: Federation of Social Agencies, 1938. 21 pp. Price, \$25.

CATALOG. CHEMICAL PUBLISHING CO. New York City. 126 pp. Price, \$1.0.

SANITARY ENGINEERING AS A CAREER. Chicago: Institute for Research, 1938. Price, \$1.00.

PUBLIC HEALTH AND MEDICAL LICENSURE IN THE STATE OF MISSISSIPPI, 1798-1937. By Felix J. Underwood and R. N. Whitfield. Jackson: Tucker Printing House, 1938. 175 pp.

CAUSE AND PREVENTION OF DISLASE. By William Harvey Perkins. Philadelphia: Lea & Febiger, 1938. 713 pp. Price, \$7.50.

CHEMICAL ANALYSIS OF FOODS AND FOOD PRODUCTS. By M. B. Jacobs. New York: Van Nostrand, 1938. 537 pp. Price, \$6.00.

LIFE, HEAT AND ALTITUDE. By David Bruce Dill. Cambridge: Harvard University Press, 1938. 211 pp. Price, \$2.50.

TUBERCULOSIS AND LEPROSY. The Mycobacterial Diseases. Editor—Forest Ray Moulton. The American Association for the Advancement of Science. Symposium Series, Vol. I. Lancaster: Science Press, 1938. 133 pp.

AMERICAN FOUNDATIONS FOR SOCIAL WELFARE. Compiled by Russell Sage Foundation Library. Rev. edition. New York: Russell Sage Foundation, 1938. 66 pp. Price, \$50.

HOW TO LIVE. By Irving Fisher and Haven Emerson. 20th ed. New York: Funk & Wagnalls, 1938. 422 pp. Price, \$2.50.

MENTAL HEALTH THROUGH EDUCATION. By W. Carson Ryan. New York: Commonwealth Fund, 1938. 315 pp. Price, \$1.50.

MATERNITY SERVICES. By Dame Janet Campbell. London: Faber & Faber, 1937. 56 pp. Price, \$50.

STATE RULES AND REGULATIONS GOVERNING SAFETY EDUCATION IN THE UNITED STATES. By Dr. F. R. Noffsinger. Washington: American Automobile Assn., 1938. 30 pp.

THE ROAD TO SAFETY SEEPS. By Horace Mann Buckley *et al.*

A. Away We Go.	56 pp.	Price \$20
B. Happy Times.	137 pp.	56
C. In Storm and Sunshine.	152 pp.	64
D. In Town and Country.	216 pp.	72
E. Here and There.	285 pp.	72
F. Around the Year.	346 pp.	76
G. On Land and Water.	357 pp.	80
H. Who Travels There.	440 pp.	88

New York: American Book Co., 1938.

ASSOCIATION NEWS

THE HEALTH CONSERVATION CONTESTS

THE Health Conservation Contests for cities and rural areas, conducted jointly by the United States Chamber of Commerce and the American Public Health Association, have completed another year. Elsewhere* announcement has been made of the winners for 1937, during which year the City Contest completed its ninth year and the Rural Contest its fourth. The Rural Contest is supported financially by the W. K. Kellogg Foundation, and the City Contest by several insurance companies.

Among the outstanding features of the 1937 Contests were: the participation by the Canadian provinces in the Rural Contest, the two new special Contests for excellence in tuberculosis and syphilis control, and the general expansion of both the Rural and City Contests in the United States. The Canadian Contest, new in 1937, was sponsored jointly by the Canadian Public Health Association and the American Public Health Association.

Both the City and Rural Contests showed substantial growth in the number of areas participating. Of the urban population in the United States, more than 3 million additional persons were included in participating cities in 1937 than in 1936, while in the Rural Contests in the United States there was an increase of almost 17 per cent in the number of rural units submitting schedules.

The Canadian rural units set a remarkable all-time record by enrolling

almost 100 per cent of their units, and of these units more than 90 per cent submitted schedules. To Quebec Province goes the international record of enrolling 35 units and having 32 submit completed schedules. All together, 37 states, 4 Canadian provinces and Hawaii were included in the areas competing for awards.

It was apparent to the Grading Committee at its April meeting that the interest in the Health Conservation Contests is increasing and not waning; for example, in 1937, 263 cities participated and of these, 26 were new cities, while 241 rural units enrolled, of which 34 were new. Most encouraging in the schedules were the many improvements in basic public health which were reported. In no previous year have so many additions to personnel been made, in no other year have we seen so much improvement in the office equipment of health departments and in no previous year has it been possible to cite so many activities or such intensification of existing activities in the local programs.

There has been a significant shift between the City and Rural Contests because of the fact that, with the growth of organized rural full-time health service, many smaller cities are now corporate parts of rural units. There were 15 cities which have been enrolled in the City Contest which in 1937 took their place as a corporate part in the participating rural units. All together, across the years, there are 57 cities formerly participating in the City Contest which are now a part of rural units.

* *A.J.P.H.*, June, 1938, p. 795.

Field service to enrolled cities and counties has been at a high level in 1937. In addition to the 17 rural units representing 23 counties in Canada which were given field service, there were 120 individual county rural units and 19 districts embracing 64 counties which were visited in the United States. One hundred fifty-six rural visits were made to 207 rural counties. Funds have been available only to a limited extent for field service to cities but 55 visits have been paid to cities and, as a result, certain important areas are now included for the first time in the Contest. This field service, in addition to the visits to state health departments, made personal contacts with local

health departments in 28 states, 2 provinces, and the District of Columbia. Since the establishment of the Rural Contest in 1934, 343 different rural units representing 387 counties in the United States have been visited, in addition to the 23 Canadian counties, or a total of 410 counties in the two countries.

While emphasizing the important part which the local business man plays in the Health Conservation Contests, a well informed physician recently stated, "If there has been a recession in business, there has been no recession by business men in their interest and effort to make their communities safe for the democracy of public health."

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Harry S. Allen, M.D., 322 N. 6 St., Ironton, O., Health Commissioner
 Will H. Aufranc, M.D., Health Office, Kennett, Mo., District State Health Officer
 Seth S. Barnes, M.D., 222 Independence St., Cape Girardeau, Mo., District State Health Officer
 Edgar E. Berg, M.D., Flavel House, Astoria, Ore., Clatsop County Health Officer
 Arthur D. Blackburn, M.D., Court House, Circleville, O., Pickaway County Health Commissioner
 Howard E. M. Boocks, M.D., East Main St., Logan, Ohio, City Health Commissioner
 Walter J. Broad, M.D., Geneva, Ala., Geneva County Health Officer
 Enoch M. Bryan, M.D., Fredericktown, Mo., District State Health Officer
 Andrew Carney, 121 Prospect St., Westfield, N. J., Executive Officer, Board of Health
 Warren D. Carter, M.D., C.P.H., Box 625, Morganton, N. C., Burke-Caldwell District Health Officer
 Dr. Gonzalez Corbalan Trumbull, Casilla 518, Santiago de Chile, S. A., Jefe del Departamento de Sanidad Internacional del Servicio de Salubridad Publica de Chile
 Charles L. Coyle, M.D., Court House, Coquille, Ore., Coos County Health Officer
 John D. Fuller, M.D., Santa Cruz County

Hospital, Santa Cruz, Calif., County Health Officer
 G. G. A. Herzog, M.D., Highway 66, Cuba, Mo., County Health Officer
 Shelton E. Johnson, M.D., 5810 Cowen Place, Seattle, Wash., Specialist Physician, U. S. Dept. of the Interior
 Alfred H. MacLaren, M.D., City Hall, Pendleton, Ore., Director, Umatilla County Health Unit
 Charles W. Meinershagen, M.D., Salem, Mo., District State Health Officer
 Joseph R. Morrell, M.D., 2535 Eccles Ave., Ogden, Utah, President, State Board of Health
 William J. Sullivan, M.D., Kirksville, Mo., District State Health Officer
 Dan P. Trullinger, M.D., Rm. 304, Court House, Oregon City, Ore., Acting County Health Officer, Clackamas County Health Unit
 Luther P. Walter, Jr., M.D., City County Health Unit, El Paso, Tex., Assistant Director

Laboratory Section

David M. Baldwin, 1118 Washington Ave., Philadelphia, Pa., Bacteriologist, John Wyeth & Bro., Inc.
 Georgene W. Blauer, Rt. 4, Box 248, San Jose, Calif., Student

Evalyn J. Cowan, 901-6th Ave., Seattle, Wash., Assistant Bacteriologist, State Dept. of Health

Felix E. Fernandez Garcia, M.D., Luis Estevez 461, Vibora, Habana, Cuba, Chief, Bacteriological Dept., National Laboratory

Maude W. Fos, 1960-9W., Seattle, Wash., Bacteriologist, State Dept. of Health

John T. Glenn, Jr., Glenolden, Pa., Bacteriologist, Mulford Biological Laboratories, Sharp & Dohme

Maud Gober, State Board of Health, Jackson, Miss., Bacteriologist

Josie Haried, State Dept. of Health, Lansing, Mich., Senior Chemist

J. V. Irons, Sc.D., 705 E. 17th, Austin, Tex., Assistant Director of Laboratories, State Dept. of Health

Paul W. Kabler, M.D., Ph.D., State Dept. of Health, University Campus, Minneapolis, Minn., Assistant Chief of Laboratories, Division of Preventable Diseases

E. Lynn Kisner, 12 Municipal Courts, St. Louis, Mo., Supervisor of Chemistry, Health Division

William V. Knoll, M.D., 1200 N. State, Los Angeles, Calif., Clinical Laboratory Worker, Los Angeles General Hospital

Alice McElroy, 1225 Walnut St., Alameda, Calif., Student

Carrie A. Moorman, 1417 Smith Tower, Seattle, Wash., Bacteriologist, State Dept. of Health Laboratories

Questa G. Mountain, 1417 Smith Tower, Seattle, Wash., Laboratory Technician, State Dept. of Health

Charles R. Nicewonger, 159 Tamalpais Rd., Berkeley, Calif., Student

Bernice M. Pedersen, 1417 Smith Tower, Seattle, Wash., Laboratory Technician, State Dept. of Health

Norman B. Powell, 212 E. Parkway Drive, Columbia, Mo.

Frederick P. Sparks, M.D., Kootenay Lake General Hospital, Nelson, B. C., Canada, Medical Health Officer and Director of City Laboratory

Alexander I. Teplow, 426 N. Virgil Ave., Los Angeles, Calif., Technician, Los Angeles County General Hospital

Ernesto Trelles y Duelo, Edificio Govea 13 y 18 Vedado, Havana, Cuba, Chief Chemist and Bacteriologist, Havana Water Works

Vital Statistics Section

Margaret O. Swenson, State Office Bldg., St. Paul, Minn., Statistician, Division of Vital Statistics, State Dept. of Health

George K. Traver, 396 Union Ave., West Haven, Conn., Registrar of Vital Statistics

Public Health Engineering Section

Robert R. Balmer, Jr., 17 Eden St., Salem, Mass., Junior Sanitary Engineer, State Dept. of Public Health

A. R. Baron, Fredericktown, Mo., District State Public Health Engineer

Theodore J. Bommer, 327 E. Stoddard, Dexter, Mo., Public Health Engineer, State Board of Health

John M. Borden, 605 Jackson St., Oregon City, Ore., Clackamas County Sanitarian

James B. Carey, 2352 Winchester Ave., Ashland, Ky., Eastern District State Sanitary Engineer

Carl V. Erickson, Urbana and Champaign Sanitary District, Urbana, Ill., Manager

Wallace G. Grange, 316 N. 2nd E., Price, Utah, City Sanitarian

Richard S. Green, 101 Willow Ave., Somerville, Mass., Senior Sanitary Engineering Aid, Division of Sanitary Engineering, State Dept. of Public Health

William A. Hasfurther, 7723 S. Ada St., Chicago, Ill., Sanitary Engineer, State Dept. of Health

Edward O. Madison, 2411 N. Charles, Baltimore, Md., Assistant State Director, Community Sanitation Program, U. S. Public Health Service

Harold F. Rock, 46 Petrova Ave., Saranac Lake, N. Y., Junior Sanitary Engineer, State Dept. of Health

Claude Strickland, 1703-40 St., S., St. Petersburg, Fla., Supt., Pinellas County Anti-Mosquito District

Carmen A. Sullivan, Box 103, Ontonagon, Mich., Sanitarian, State Dept. of Health & Children's Fund

Food and Nutrition Section

M. Thomas Bartram, Ph.D., Food and Drug Admr., U. S. Dept. of Agr., Washington, D. C., Assistant Bacteriologist

Martha Koehne, Ph.D., 75-18 Ave., Columbus, O., Nutritionist, State Dept. of Health

Ralph L. MacNeil, 3433-90 St., Jackson Heights, L. I., N. Y., Chemist, Bureau of Food and Drugs, Dept. of Health

Esther Pickios, 55-21-138 St., Flushing, L. I., N. Y., Student

William J. Wollesen, Jr., 711-6 Ave., San Francisco, Calif., Trainee, Sanitary Inspector, University of California School of Public Health

Child Hygiene Section

Allen O. Gruebbel, D.D.S., State Board of Health, Jefferson City, Mo., Dental Director, Child Hygiene Division

Marie A. Hagele, M.D., 1819 W. Polk St., Chicago, Ill.
 Frank T. Jones, D.D.S., 306 State Bldg., San Francisco, Calif., Dentist, State Dept. of Public Health
 Arthur W. Stahl, M.D., 238 Republic Bldg., Denver, Colo., Denver Public Schools
 G. D. C. Thompson, M.D., 816 Oregon Bldg., Portland, Ore., Director, Division of Maternal and Child Health, State Board of Health

Industrial Hygiene Section

Arthur M. Master, M.D., 125 E. 72 St., New York, N. Y.

Public Health Education Section

Alice M. Bahrs, Ph.D., 10 & Montgomery Sts., Portland, Ore., Head of Science Dept., St. Helen's Hall Junior College
 Darrell A. Dance, P. O. Box 202, Mays Landing, N. J., Sanitary Inspector, State Dept. of Health
 Alfred Korach, M.D., 1640 Cambridge St., Cambridge, Mass., Visiting Lecturer in Public Health Administration, Massachusetts Institute of Technology
 Elizabeth McGuire, 1017 W. 31st, Austin, Tex., Organizer of County Children's Councils, State Dept. of Health
 Grace C. Nason, Box 303, Moab, Utah, Public Health Nurse, State Board of Health
 Alexander J. B. van Beyer, Dr.P.H., 308-16 S. Craig St., Pittsburgh, Pa., Director, Prevention of Blindness Dept., Pa. Assoc. for the Blind

Public Health Nursing Section

Catherine O. Beagin, R.N., P. O. Box 1854, Miami, Ariz., School Nurse
 Helen P. Bott, Price, Utah, County and School Nurse, State Board of Health
 Lula M. Champion, 105 E. Bexar, Crystal City, Tex., County Public Health Nurse
 Eunice Lamona, R.N., 6028 Harcourt Ave., Los Angeles, Calif., Chief Nurse, Board of Education
 Mabel A. Patton, State Board of Health.

Raleigh, N. C., Consultant in Public Health Nursing, State Board of Health
 Margaret L. Payton, R.N., Court House, Oregon City, Ore., Senior Public Health Nurse, Clackamas County Health Unit
 LaVerna Peterson, 2329 Monroe Ave., Ogden, Utah, Acting Director, Division of Public Health Nursing, State Board of Health
 Lydia Potthoff, R.N., 727 E. Willette, Phoenix, Ariz., Nursing Consultant, State Board of Health
 Helene K. Sabert, R.N., Board of Health, Honolulu, T. H. (Student until August). Nursing Supervisor
 Muriel Schopp, 3085 Andover Drive, St. Louis County, Mo., Public Health Nurse
 Louise Schott, R.N., Benton, Mo., District State Health Nurse
 Marcella A. Schumer, Perryville, Mo., District State Health Nurse
 Laura P. Stead, 35 E. Lakeview Ave., Columbus, O., Field Representative, State Dept. of Health
 Luella M. Stickney, State Board of Health, Helena, Mont., Maternal and Child Health Field Advisory Nurse
 Hedwig B. Trauba, 130 State Capitol Bldg., Salt Lake City, Utah, Assistant Director and Orthopedic Nursing Consultant, State Crippled Children's Service
 Martha J. West, R.N., P. O. Box 769, Price, Utah, Public Health Nursing Supervisor, State Board of Health
 Rosannah Winter, R.N., 3211 S. W. 10 Ave., Portland, Ore., Field Nursing Consultant, State Board of Health
 Miriam V. Wolf, 216 Morrison Drive, Toledo, O., Field Nursing Consultant, State Dept. of Health

Unaffiliated

Alice Marshall, 400 Paxton Bldg., Omaha, Nebr., Executive Secretary, Nebr. Tuberculosis Assoc.
 Charles A. Newhall, 6505-21 Ave. N. E., Seattle, Wash., Chemical Engineer, State Dept. of Health

DECEASED MEMBERS

W. Alfred Buice, M.D., Dr.P.H., Chelsea, Okla., Elected Member 1925, Fellow 1934
 W. F. Elgin, M.D., Glenolden, Pa., Elected Member 1900, Fellow 1922
 W. H. Frost, M.D., Baltimore, Md., Elected Member 1909, Fellow 1923
 Frank L. Watkins, M.D., Great Falls, Mont., Elected Member 1927, Fellow 1931

Robert W. Fowler, M.D., Richmond Hill, L. I., N. Y., Elected Member 1937
 Arthur M. Gibbs, M.D., C.P.H., Hamburg, Ark., Elected Member 1931
 Henry S. Plummer, M.D., Rochester, Minn., Elected Member 1924
 Bertha K. Spector, Ph.D., Chicago, Ill., Elected Member 1916

CLOSING DATE FOR SUBMITTING APPLICATIONS FOR FELLOWSHIP

SEPTEMBER 1 is the latest date the Committee on Eligibility can accept Fellowship applications. This date is set in order that there may be sufficient time to route them through the preliminary steps necessary before they

receive final consideration at the hands of the Governing Council during the Kansas City Annual Meeting. Eligible members who wish to apply for Fellowship are therefore urged to submit their applications in the near future.

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Joint Vocational Service, 122 E. 22 Street, New York, N. Y., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS AVAILABLE

Wanted: Deputy Commissioner of Health. Midwestern city of 130,000. Under 45 years of age; particularly to be in charge of health of public schools. Give education, experience, qualifications and references. W376

The Civil Service Commission announces nurse positions in the Indian Field Service (including Alaska), Department of Interior. They are:

Public Health Nurse, \$2,000 a year

Graduate Nurse (General Staff Duty), \$1,800 a year

Nurse Technician (Bacteriology and Roentgenology Combined), \$1,800 a year

Closing date for receipt of applications are as follows:

- (a) July 18, 1938, if received from states other than those named in (b) below.
- (b) July 21, 1938, if received from the following states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

Write: U. S. Civil Service Commission, Washington, D. C.

POSITIONS WANTED

HEALTH OFFICERS

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins, and 14 years' public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, aged 38, with excellent training in medicine, pediatrics, and epidemiology, is completing work for Dr.P.H., and will consider appointment in administration, preferably in county health work. A366

Physician, M.D.; Class A medical school; M.P.H., Harvard School of Public Health; extensive experience in pediatrics and school medical service; also background of county health administration and teaching in medical school, will consider expanded opportunity in teaching or research. A302

Physician, M.D., St. Louis University: postgraduate in eye, ear, nose, and throat; 10 years' experience in public health administration as director of county health units and epidemiologist with state department; also experience in welfare administration.

POSITIONS WANTED (Cont.)

tion; prefers administrative public health position in central or western state. Excellent references. Available July 1. A373

Physician, experienced in health administration of cities and states, will consider attractive opening in maternal and child health or health education. A343

Physician, M.D., Class A school; M.S.P.H., University of Michigan, 1937; now serving as district state health officer, seeks full-time administrative position in city or county. A367

Physician, M.D., McGill; C.P.H., Johns Hopkins; excellent background of communicable disease control and school health service, seeks position as epidemiologist or public health administrator. A368

CHILD HYGIENE

Experienced physician, M.D. and Ph.D., University of Minnesota; specially qualified in maternal and child hygiene, directing state and local programs; will consider position of better sort. A238

HEALTH EDUCATION

Young woman, M.A. in Health Education, Teachers College, Columbia University; with splendid international experience, seeks position as director of health education, with preference for New York City. H369

Sanitarian and health education activity worker with seven years' experience; Dr.P.H., Michigan; desires position in health education and/or social research work. M375

LABORATORY

Young man, A.B. in Chemistry, Phillips University; M.S. in Public Health Laboratory Work, University of Michigan; desires position in state or city health department laboratory. L304

Young woman, M.S., University of Michigan, experienced in biochemistry, bacteriology, water analysis and blood work, will consider research position. L322

Bacteriologist and pathologist with wide administrative experience; Ph.D., Brown University; will consider leading position in his field. L371

SANITARY ENGINEERING

Sanitary engineer, courses at Rutgers University, with 17 years' experience in design, research and construction of water and sewage plants, as well as aerial pollution surveys, desires position, preferably research. E321

Graduate sanitary engineer with service under U. S. Public Health Service and state departments of health, especially interested in filtration plant design and operation and shellfish sanitation, seeks employment. E356

MISCELLANEOUS

Young man, age 27, S.B., Massachusetts Institute of Technology, 1933; A.M., Boston University, 1935; M.S. in Biochemistry, University of Michigan, 1937; 2 years' graduate work in public health. Experienced in chemical, bacteriological and biochemical research; teaching experience in college hygiene, desires position in a food industry involving research or control. M374

NEWS FROM THE FIELD

NATIONAL HEALTH CONFERENCE

THE National Health Conference, called at the suggestion of President Roosevelt, and under the direction of the President's Interdepartmental Committee to Coördinate Health and Welfare Activities, will be held in Washington July 18-20.

Miss Josephine Roche, former Assistant Secretary of the Treasury, is Chairman of the Interdepartmental Committee, appointed by the President August 15, 1935, and consisting of officials of the Social Security Board and the Treasury, Departments of Agriculture, Interior, and Labor. The committee has been assisted in its preliminary work by the Technical Committee on Medical Care, comprising experts from the U. S. Public Health Service, the Children's Bureau, and the Social Security Board.

NEW JERSEY AND NEW YORK PRE-MARITAL EXAMINATIONS FOR SYPHILIS

EFFECTIVE July 1, 1938, Chapter 126 of the New Jersey Public Laws of 1938 requires that each applicant for a marriage license in New Jersey must present a certificate from a qualified physician stating that the applicant has submitted to a standard laboratory blood test for syphilis and that in the opinion of the physician the person either is not affected with syphilis or is not in a stage of that disease which may become communicable. These certificates for each party to be married are attached to the marriage license and remain with the license until the certificate is filed with the State Bureau of Vital Statistics.

No marriage license will be issued in New York State on and after July 1, 1938, unless both parties submit state-

ments that the applicants have been examined and found to be free from syphilis in a stage which may become communicable, according to rules and regulations for the administration of the new amendments to the Domestic Relations Law. The statement, to be submitted on a form provided, must be signed by a licensed physician together with an official statement from a laboratory approved for that purpose showing that the applicant was given an examination including a standard serological blood test for syphilis.

The date of examination will be interpreted to be the date on which the physician takes the specimen of blood from the applicant and which shall not be more than the 20th day prior to that on which the license is applied for unless such time shall have been extended (limited to 90 days). In forwarding completed marriage records to the State Department of Health by the clerk in each case there shall be attached thereto the court order, physician's and laboratory's statement after notation thereof in the register.

PAN AMERICAN SANITARY CONFERENCE

THE 10th Pan American Sanitary Conference will be held in Bogota, Colombia, September 4-18. Some of the subjects to be discussed are: social security in its medical and public health aspects, a Pan American campaign against venereal disease, control and prevention of yellow fever, recent achievements in the study of leprosy and the campaign against the disease, and the problem of germ and virus carriers in epidemiology.

ALABAMA COUNTIES

DR. J. N. Baker, State Health Officer of Alabama, has announced that there is now a full-time health organization in each of the 67 counties of Alabama.

TRAFFIC SAFETY TRAINING

THE National Institute for Traffic Safety Training will be held at the University of Michigan, Ann Arbor, Mich., August 8-20.

Technical courses will be given as follows:

- Traffic Accident Reports and Records—1st week only
- Traffic Safety Education in Schools—2 one week courses
- Examining Drivers' License Applicants—1st week only
- Handling Drivers With Bad Records—2nd week only
- Traffic Engineering
- Training Investigators in Accident Prevention Bureaus
- Safety Organization and Public Education—2nd week only

Some of the topics of general meetings will be:

What Is Safety? The New War on Traffic Accidents. What We Know About Accidents and How We Know It. The Road. The Car. The Driver. The Pedestrian. Speed. Engineering. Enforcement. Mock Intoxication Trial. School and Child Safety. Public Education and Organization.

For information, write: Sidney J. Williams, 20 North Wacker Drive, Chicago, Ill.

SAFETY EDUCATION

NEW York University announces a plan to establish a national center for safety education and accident control, planned primarily for the instruction of teachers, in the University's Division of General Education, July 1. The project will be set up under a special grant of funds from the National Conservation Bureau.

As part of the program, a maximum of 18 research fellowships in safety education, with stipends ranging from \$400 to \$1,200, will be offered for graduate students enrolled in the University's School of Education during 1938-1939 academic year. Applica-

tions for fellowships can be secured from the Fellowship Committee on Safety Education, Division of General Education, New York University, New York, N. Y. They must be filed by July 25, 1938.

COLORADO PUBLIC HEALTH ASSOCIATION

THE Colorado Public Health Association has been organized with A. L. Beaghler, M.D., President; Roy L. Clear, M.D., Vice-President; Omer R. Gillett, M.D., Treasurer; and Lucile O'Reilly, Secretary.

An application has been received for affiliation with the American Public Health Association. The association represents a consolidation of what formerly was The Colorado Council of State-wide Health Agencies and aims to include all the professional public health workers in Colorado.

ALABAMA HEALTH DISTRICT

THE East Alabama Health District, comprising the Counties of Bullock, Chambers, Lee, Macon, Randolph, Russell, and Tallapoosa, has recently been organized with headquarters at Opelika. The new unit is the outgrowth of a field training base at Opelika, which has been conducted by the Alabama State Department of Health.

In connection with the unit, the Rockefeller Foundation has for several years sponsored a clinical research study in tuberculosis.

Arthur H. Graham, D.P.H., M.D., of Opelika, has been named Medical Director of the new health district.

CONSUMERS ORDER USE OF SANITARY UTENSILS

GREENBELT, Md., has the first Coöperative drugstore in the United States.

When it opened April 21, a committee of consumers had ordered that only paper cups be used at the soda fountain.

SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION

THE South Carolina Public Health Association held its annual meeting at Myrtle Beach, S. C., May 23 to 25. The program of several sessions included such subjects as syphilis control, maternity care, general practice and its relation to public health, orthopedic problems, today's trend in public health, malaria control, public health dentistry, the county vital statistics program, public health nursing in crippled children's program, interpretation of laboratory findings, the trend of public health activities in pediatric practice, the sanitation problem created by the touring public, the prevention of blindness, etc.

The following officers were elected:

President, W. B. Furman, M.D., Pickens
President-Elect, G. E. McDaniel, M.D., Columbia
Vice-President, J. R. Wise, Newberry
Secretary-Treasurer, Mrs. Frank George, R.N., Columbia

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

THE Public Health Association of New York City held its annual meeting in New York May 18.

New officers elected to serve until the next annual meeting are:

President, Hazel Corbin
First Vice-President, Arthur I. Blau, M.D.
Second Vice-President, George T. Palmer, Dr.P.H.
Secretary-Treasurer, Frank Kiernan

The Executive Board is composed of 12 persons, 6 of whom are elected at each annual meeting. The Directors elected at the May 18 meeting, to serve until 1940, are:

Arthur P. Miller, C.E.
 John Oppie McCall, D.D.S.
 Ralph S. Muckenfuss, M.D.
 John L. Rice, M.D.
 Leopold M. Rohr, M.D.
 Alfred E. Shipley, M.D., Dr.P.H.

The Directors who were elected at the annual meeting in 1937, to serve until the annual meeting in 1939, are:

Donald B. Armstrong, M.D.
 Thomas J. Duffield
 Leonard Greenburg, M.D.
 Helen Manzer, Ph.D.
 Josephine B. Neal, M.D.
 Clarence L. Scamman, M.D.

ILLINOIS HEALTH OFFICERS

THE Illinois State Department of Health announces that the following physicians have been placed in charge of recently established full-time health districts:

James A. Poling, M.D., Freeport—District 4, Lee and Ogle Counties
 Carl A. Peterson, M.D., Moline—District 5a, Henry and Mercer Counties
 Sandor Horwitz, M.D., Peoria—District 6, Marshall, Peoria and Putnam Counties
 John P. Walsh, M.D., Greenview—District 11, Case, Logan and Mason Counties
 Robert H. Bell, M.D., Carlinville—District 12, Calhoun, Greene, Jersey, Macoupin, Morgan, Scott, and (emergency) Bond, Madison, and Montgomery Counties
 Nettie A. M. Dorris, M.D., Paris—District 13, Champaign, Coles, Douglas, Edgar and Vermillion Counties
 Joseph L. Bryan, M.D., Xenia—District 14, Clay, Clinton, Effingham, Jasper, Marion, and (emergency) Fayette Counties.
 Roy W. Harrell, M.D., Carbonvale—District 16a, Jackson, Monroe, Perry, Randolph, Washington, and (emergency) St. Clair Counties.
 Roland R. Cross, M.D., Dahlgren—District 18, Franklin, Hamilton, Jefferson, Wayne and White Counties.
 Lewis S. Barger, M.D., Golconda—District 20, Gallatin, Hardin, Johnson, Massac, Saline, Pope and Williamson Counties.

It is planned to have 20 health districts in Illinois on a full-time basis.

CONNECTICUT PUBLIC HEALTH ASSOCIATION

THE 23rd annual meeting of the Connecticut Public Health Association was held at the Stratfield Hotel in Bridgeport, on May 25.

Approximately 200 persons attended

the several sessions which covered a variety of public health problems. In addition to leading health workers in Connecticut who participated in the program, contributions were also made by Earle G. Brown, M.D., Nassau County Health Commissioner, Mineola, N. Y., James L. Barron, C.E., Director, Division of Sanitation, Westchester County Department of Health, White Plains, N. Y., John A. Ferrell, M.D., Dr.P.H., Associate Director, International Health Division, Rockefeller Foundation, New York, N. Y., and Mary McManus, R.N., Superintendent, Tuberculosis Nursing Service, New York City Department of Health.

Officers for the ensuing year were elected as follows:

President, Professor Ira V. Hiscock, New Haven

President-Elect, Warren J. Scott, S.B., Hartford

Vice-President, Richard O'B. Shea, M.D., Bridgeport

Secretary-Treasurer, Benjamin G. Horning, M.D., Hartford

Representative on Governing Council of the American Public Health Association, Louis J. Dumont, M.D., New Britain

PERSONALS

Central States

CORNELIUS A. HARPER, M.D.,* of Madison, Wis., having completed 34 years as state health officer, is now the senior public health official in the United States from the point of unbroken service. He was appointed to the State Board of Health in 1902 and became the executive in 1904.

JOHN A. MURPHY, M.D., has been appointed Health Commissioner of East Liverpool, Ohio, to succeed Roy C. COSTELLO, M.D.†

DR. BROCKWAY D. ROBERTS, of Wayland, Ia., has been appointed Professor of Hygiene and Director of Student Health at Knox College, Galesburg, Ill.

DR. LOUIS W. SPOLYAR, of Indianapolis, Ind., will be in charge of the new Department of Industrial Hygiene created by the Indiana State Department of Public Health.

Eastern States

S. S. GOLDWATER, M.D.,* since 1934 Commissioner of the Department of Hospitals of New York, N. Y., has announced his retirement, but will continue in office until the appointment of his successor.

GEORGE LAMBERT, M.D., who has been Acting Health Officer, has been appointed Health Officer of Killingly, Conn.

ARTHUR D. MARSH, M.D., has been pointed Health Officer of Scotland, Conn.

J. H. McLAUGHLIN, M.D., succeeds EMILY B. CHATFIELD, M.D.,† as Health Officer of Voluntown, Conn.

THOMAS PARRAN, M.D.,* Surgeon General of the U. S. Public Health Service, was the recipient on June 1 of the degree of Doctor of Science, conferred by Columbia University, New York, N. Y. On June 8, at the 106th commencement of New York University, he received the degree of Doctor of Public Health.

WILFRED J. ROBINSON, M.D., has been appointed Health Officer of East Windsor, Conn., succeeding DR. GEORGE E. PORTER, deceased.

JAMES A. TOBEY, DR.P.H.,* of New York, N. Y., Director of Nutrition of the American Institute of Baking, was awarded the honorary degree of Doctor of Laws at the commencement exercises of Southeastern University in Washington, D. C., on June 7.

ABRAHAM WHITE, PH.D., Assistant Professor of Physiologic Chemistry,

* FELLOW A.P.H.A.
* MEMBER A.P.H.A.

Yale University, New Haven, Conn., received the \$1,000 prize and bronze medal of Eli Lilly and Company, Indianapolis, Ind., at the American Chemical Society meeting in Dallas, Tex., April 18, for his work on sulfur metabolism and protein hormones.

Southern States

DR. FRANCIS J. CLEMENTS, formerly of Palmyra, has been appointed Health Officer of Sussex County, Va., succeeding Dr. JOHN B. H. BONNER.†

DR. ABRAM J. DAVIS, Director of Health of Burke County, Ga., was elected President of the Southeast Georgia Public Health Association at its meeting April 9, in Waynesboro.

SAMUEL R. DAMON, PH.D.,† of Montgomery, Ala., formerly with Johns Hopkins University School of Medicine, Baltimore, Md., has been placed in charge of the laboratories of the Alabama State Department of Health, succeeding JAMES G. McALPINE, PH.D.,† resigned.

DR. JULIUS E. DUNN, formerly Health Officer of DeKalb County, has been appointed Health Officer of Lauderdale County, with headquarters in Florence, Ala.

DR. WILLIAM L. GILBERT, of Atlanta, Ga., Health Officer of Fulton County, has resigned on account of ill health, but will continue in the position until his successor has been named.

DR. GEORGE M. HARMS, of Chatom, Ala., has been appointed Health Officer of Washington County, succeeding Dr. CHARLES M. COLE, resigned.

JOSEPH A. MORRIS, M.D.,† of Oxford, N. C., has been named President of the North Carolina Public Health Association.

DR. GEORGE E. NEWTON was recently named Health Officer of Autauga

County, with headquarters in Prattville, Ala. He held a similar position in Lauderdale County.

DR. FRANCIS W. UPSHUR, of Richmond, Va., has been appointed to direct a program for the control of venereal disease in that city.

Western States

DR. CHARLES A. DAVLIN, of Alamosa, has been elected President of the Denver, Colorado, State Board of Health, succeeding Dr. PAUL J. CONNOR, of Denver.

J. C. GEIGER, M.D.,* Director of Public Health of the City and County of San Francisco, Calif., has had conferred upon him the honorary degree of Doctor of Laws by the University of Santa Clara, at its commencement June 4, on the Campus, Santa Clara, Calif., for his humanitarian activities in the public service.

DR. JULIO R. SOLTERO, of Lewistown, Mont., has been reappointed Health Officer of Fergus County.

DR. WENDELL NOALL has been appointed Health Officer of Ogden, Utah, succeeding Dr. WILBURN J. WILSON.

DEATHS

MAURICE CROWTHER HALL, PH.D., Sc.D., D.V.M.,† Chief of the Division of Zoölogy of the National Institute of Health, U. S. Public Health Service, Washington, D. C., died May 1, after a long illness. Though well known for many studies in the field of parasitology, with special reference to the helminths, Dr. Hall was perhaps best known for his discovery in 1921 that carbon tetrachloride is an effective vermifuge for men and animals. In 1925 he announced that tetrachlorethylene is as effective as carbon tetrachloride and apparently much safer.

* Fellow A.P.H.A.

† Member A.P.H.A.

ROYAL S. COPELAND, M.D., Life Member A.P.H.A., U. S. Senator from New York, died June 17, in Wash-

ington, D. C. He became a member in 1918, a Charter Fellow in 1922, and a Life Member in 1936.

CONFERENCES AND DATES

- American Association of Motor Vehicle Administrators. Detroit, Mich. September.
- American Association of School Health. Kansas City, Mo. October 24-28.
- American Association of State Registration Executives. Kansas City, Mo. October 25-28.
- American Dental Association. Hotel Statler, St. Louis, Mo. October 24-28.
- American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9-14.
- American Federation of State, County, and Municipal Employees. Atlanta, Ga. August 29.
- American Hospital Association. Dallas, Tex. September 26-30.
- American Public Health Association — 67th Annual Meeting. Hotels Muehlebach, President, Kansas Citian, Kansas City, Mo. October 25-28.
- American Public Works Association. New York, N. Y. October 3-5.
- American Society of Civil Engineers. Rochester, N. Y. October 12-14.
- American Veterinary Medical Association. New York, N. Y. July 5-9.
- American Water Works Association: Central States Section. Hotel Windsor. Wheeling, W. Va. August 17-19.
- Virginia Section. Hotel Robert E. Lee, Lexington, Va. August 25-26.
- Rocky Mountain Section. Townsend Hotel, Casper, Wyo. September 12-13.
- Michigan Section. Bancroft Hotel, Saginaw, Mich. September 14-16.
- New York Section. Nelson House, Poughkeepsie, N. Y. September 22-23.
- Minnesota Section. Minneapolis, Minn. September 29-October 1.
- Wisconsin Section. Milwaukee, Wis. October 10-12.
- Missouri Valley Section. Hotel Fort Des Moines, Des Moines, Ia. October 13-15.
- Southwest Section. Biltmore Hotel, Oklahoma City, Okla. October 17-20.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13-15.
- Association of Women in Public Health — 17th Annual Conference. Excelsior Springs, Mo., October 22-23; Kansas City, Mo., October 24.
- California Association of Dairy and Milk Inspectors. Santa Barbara, Calif. September.
- Conference of State Laboratory Directors. Kansas City, Mo. October 24.
- Conference of State Sanitary Engineers. Kansas City, Mo. October 24.
- Florida Public Health Association. Hollywood, Fla. December.
- International Association for Identification. Columbus, Ohio. August 16-20.
- International Association of Milk Sanitarians. Cleveland, Ohio. October 19-21.
- International Society of Medical Health Officers. Kansas City, Mo. October 24.
- Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13-15.
- Michigan Public Health Association. Lansing, Mich. November 9-11.

- Mississippi Valley Conference on Tuberculosis—25th Annual. Twelve states represented. Hotel Statler, St. Louis, Mo. September 21–24.
- National Dairy Association. Columbus, Ohio. October 8–15.
- National Health Conference, called under President Roosevelt's Interdepartmental Committee to Coördinate Health and Welfare Activities—Miss Josephine Roche, Chairman. Washington, D. C. July 18–20.
- National Hospital Association (Negro). Hampton, Va. August 14–16.
- National Institute for Traffic Safety Training. University of Michigan, Ann Arbor, Mich. August 8–20.
- National Safety Council. Chicago, Ill. October 10–14.
- New England Sewage Works Association. (Joint meeting with the New York State Sewage Works Association.) Hotel Bond, Hartford, Conn. October 6–8.
- New Mexico Public Health Association. Las Vegas, N. M. October 30, 31, November 1.
- New York State Sewage Works Association—Fall Meeting (joint meeting with New England Sewage Works Association). Hotel Bond, Hartford, Conn. October 6–8.
- Northern California Public Health Association. January, 1939.
- Southern Branch, American Public Health Association—7th Annual Meeting; and Southern Medical Association. Oklahoma City, Okla. November 15–16, 1938.
- Symposium on Mental Health. Auspices of the American Association for the Advancement of Science—Section on Medical Sciences. Richmond, Va. December 27–31.
- Texas Public Health Association. San Antonio, Tex. November 7–9.
- Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2–9, 1939.
- FOREIGN
- Royal Sanitary Institute. Portsmouth, England. July 11–16.
- Fourth International Congress for the Unity of Science. Girton College, Cambridge, England. July 14–19.
- Scientific Congress of Doctors and Dentists—"ARPA." Prague, Czechoslovakia. July 21–25.
- International Medical Society for Psychotherapy—10th Annual Congress. Balliol College, Oxford, England. July 29–August 2.
- British Dental Association. Belfast, Ireland. July 29–August 3.
- International Meeting for Cell Research. Anatomical Institute, Zurich, Switzerland. August 7–13.
- International Congress on Housing and Town Planning. Mexico City, Mexico. August 13–20.
- Sixteenth International Physiological Congress. Zurich, Switzerland. August 14–18.
- British Association for the Advancement of Science. Cambridge, England. August 17–24.
- International Veterinary Congress, Thirteenth. Zurich and Interlaken, Switzerland. August 20–27.
- International Congress for the History of Medicine, Ninth. Zagreb, Yugoslavia. September 3–11.
- Pan American Sanitary Conference, Tenth. (Last Conference was held in Buenos Aires, 1934.) Bogota, Colombia. September 4–18.
- Special International Conference on Sewage Works and Disposal. Glasgow, Scotland. September 12–18.
- Third United International Congress of Tropical Medicine and Malaria. Amsterdam, The Netherlands. September 24–October 1.
- Eighth International Congress of Industrial Accidents and Occupational Diseases. Frankfurt-am-Main, Germany, September 26–30.
- Pan-American Congress of Municipalities. Havana, Cuba. November.

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

August, 1938

Number 8

Mercury Poisoning from the Public Health Viewpoint*

PAUL A. NEAL, M.D.

*Passed Assistant Surgeon, U. S. Public Health Service,
Washington, D. C.*

MERCURY has ranked prominently among the causes of poisoning for several hundred years. It was known to the Egyptians in 1600 B.C. The knowledge of mercury accompanied the gradual spread of Egyptian culture to Greece, and from Greece the information passed to Rome, and thence over the Roman Empire. The Egyptians, Greeks, and Romans considered mercury too toxic for medicinal use.

Mercury was known in India about 500 B.C. where its medicinal value was recognized during the 1st century A.D., and mercury stomatitis was described during this time. The medicinal knowledge of mercury spread from India to Persia, and thence to Arabia. The Arabs brought this knowledge to Africa and Spain during the Moorish conquests. The Arabs recognized the symptomatology of mercury poisoning and made more progress in its use than the Europeans of the Middle Ages.

Paracelsus, about 1525, advocated the use of mercury in treating syphilis and

also advised its oral administration. He gave the first explanation of the effect of mercury upon the body. Due to the teaching of Paracelsus, the demand for mercury increased and a larger number of workmen were employed in mining; thus, mercury poisoning among miners was common. Fallopius in his treatise on metals states that quicksilver miners rarely last 3 years in the mines. According to Ramazzini,¹ Ettmuller affirms that in 4 months in the mercury mines the miners are seized with tremblings in the joints, palsies, and vertigo, because the mercurial spirits prove highly injurious to them. In the *Transactions of the Royal Society of London*, April, 1665, is a letter sent to this society from Venice which states that in some quicksilver mines in Italy no workman is able to work over 6 hours at a time, and an account is given of one miner, who, having worked for one-half year, was so impregnated with mercury that if he held a piece of brass in his mouth, or handled it with his fingers, it became white.

Ramazzini¹ affirms that the metallic steams affect not only those who dig

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

in the mines, but all those who are employed in working, melting, and refining the metal.

At that time mercury poisoning was very common among gilders. Ramazzini describes the case of a young gilder who died from mercurial poisoning after 2 months of confinement to his bed: "the patient was of a cachectic habit of body, face wan, cadaverous complexion, eyes swollen, breathing labored, mind stupid, and the whole body seemed seized with an inactive lazy drowsiness. He had fetid breath, stinking ulcers in his mouth which voided incessantly a very great quantity of nasty matter." Ramazzini was amazed at the absence of fever during this man's illness.

INDUSTRIAL USES OF MERCURY

Apart from the widespread use of mercury in medicine, there has been a constant increase in the use of the metal in industry. Among the applications of mercury and its compounds may be cited the use of mercury nitrate in the manufacturing of felt, which dates from the 17th century.

Industrially, mercury is used in the manufacture of chemicals and scientific instruments, and for the amalgamation of gold. It is also used in the electrical industry. This wide use entails a certain hazard from exposure to vapors and dusts. Dublin and Vane² list approximately 80 occupations with exposure to mercury and its compounds.

In Table I are listed the chief indus-

TABLE I
Principal Industries with a Potential Mercury Hazard

Name		Description	Remarks	Principal Method of Entrance Into the Body
Mining	Cinnabar (HgS)	Hazard depends upon the process used; hazardous occupations are those connected with condensers, purification, flask filling, distillation repairing and cleaning	89 mines in U. S. 1933; since 1934 several new mines in U. S. have begun operations	Inhalation of vapors and dusts
	Gold	Amalgamation with mercury, closed process used at present		Inhalation of vapors
	Silver	Amalgamation with mercury		Inhalation of vapors
Chemical manufacture	Manufacture of organic and inorganic mercury compounds	Inorganic mercurous and mercuric compounds, as chlorides, nitrates, iodides, cyanides; and organic compounds such as mercurochrome, metapphen, dimethyl and diethyl mercury compounds	Inorganic compounds produced by wet and dry method; dimethyl and diethyl mercury are volatile toxic compounds	Skin, ingestion, and inhalation of vapors and dusts
	Mercury as a catalytic agent	Starting with acetylene, using salts of mercury as catalytic agent, to produce synthetic alcohols, ketones, and acids; volatile toxic organic mercury compounds also produced Sulphonation, oxidation (Kjeldahl) bromination, nitration, alkylation (Friedel and Craft)		Inhalation of vapors
	Cyanogen	Cyanide of mercury decomposes by heat liberating cyanogen and mercury; mercuric oxide plus hydrocyanic acid gives mercuric cyanide		Skin contact; Inhalation of vapors
	Chlorine	Electrolytic process—Solvay process with sodium amalgam		Inhalation of vapors

TABLE I (Cont.)
Principal Industries with a Potential Mercury Hazard

Name		Description	Remarks	Principal Method of Entrance Into the Body
Alloy Makers, including amalgam makers		Mercury forms amalgams with most metals readily. It does not form an amalgam with iron, nickel, aluminum, cobalt and platinum.		Inhalation of vapors
Electric	Standard cells Mercury switches Mercury vapor lamps Electric contacts and insulators Electrodes Accumulators Incandescent electric lamps Electric meters Electric furnaces Radio tubes	Mercurous chloride and metallic mercury Amalgamation of zinc Amalgamation of zinc Production of the vacuum, rarely used at present Sealing induction furnaces with mercury Production of vacuum by mercury		Inhalation of vapor
Manufacture of felt hats	Fur cutting	Carrotting solution composed of a solution of mercury nitrate. In the U. S. practically all employees exposed to a measurable concentration of mercury vapors	2,000 employees in U. S.	Inhalation of vapors and dusts
	Felt hat industry	From the mercury nitrate solution used in carrotting the fur, chief occupations with mercury exposure are: mixers, blowers, coners, devil operators, hardeners, sizers, starters, stiffeners	27,600 employees in this industry	Inhalation of vapors and dusts
Dentistry		Treatment by heat of mercury amalgams especially silver and copper amalgams	Dentists Dental technicians	Inhalation of vapors
Laboratories		Manipulation of mercury Spilled mercury accumulates on floors, work benches, etc.	Chemists Physicists Physicians, etc.	Inhalation of vapors Skin
Pharmaceutical		Manufacture of antiseptics, cathartics, diuretics, disinfectants, bactericidal agents, ointments and solutions containing mercury or mercury compounds, both organic and inorganic. Spilled mercury	Chemists Physicians Laboratory assistants	Inhalation of vapors and dusts
Manufacture of	Vernicides Insecticides Fungicides	Organic and inorganic compounds of mercury. $HgCl_2$ used in wool impregnation		Skin Inhalation of dusts
Explosives	Detonators Detonating fuses Percussion caps Pyrotechnics	Mercury fulminate in copper or brass tubes $Hg(CNO)_2$ used $Hg(CNS)_2$ used in Pharaoh Serpents Hg_2SO_4 used as chemical catalyst	Hamilton found 111 cases of poisoning from Hg fulminate in 1916 in 28 Amer. munition factories	(Dermatitis) and Inhalation of dusts and vapors
Decoration of chinaware and porcelain		H_2O and Hg_2CrO_4 used for decorating chinaware and porcelain		Inhalation of vapors Irritation of skin
Photography		$HgCl_2$ and $HgBr_2$ used as intensifier Mercuric double rhodanide		Inhalation of vapors Absorption from skin

TABLE I (Cont.)

Principal Industries with a Potential Mercury Hazard

Name	Description	Remarks	Principal Method of Entrance Into the Body
Printing Trades	Pantone process employs a paste with mercury as a basis for cleaning silver typographic plates as well as for typographical operations. Vermilion is used in some inks. Production of printing plates. Color printing as used in linoleum		Inhalation of vapors
Battery	Dry battery manufacture; heat used in melting and soldering, volatilization of the mercury. Hg_2SO_4 used as a chemical catalyst in electric batteries Lead mercury solder		Inhalation of vapors
Paint	Mercury is a constituent of anti-fouling paints for ship bottoms. Tin-bismuth-mercury amalgam as a paint mixed with oil		Inhalation of dusts and vapors
Engraving, embossing	HgCl_2 used in etching of steel. Damascening of guns and swords $\text{Hg}(\text{NO}_3)_2$ used		Inhalation of vapors and dusts, skin
Mercury vapor boilers	A process of power generation which uses mercury instead of water in a boiler Use of mercury vapor for heat transfer in operations such as chemical reactions or distillations, as used in the petroleum industry		Inhalation of vapors
Jewelry	Production of imitation jewelry, copper gilded by the mercury process, or by plating process. Waste, debris, etc., washed and triturated in a mill with mercury, forms amalgam, then freed from Hg by heat. Metallic mercury. Heated mercury amalgams		Inhalation of vapors
Shooting galleries	Mercury vapors liberated from use of mercury fulminate percussion caps		Inhalation of vapors
Taxidermists	HgCl_2 used to treat skins for conservation Tin, lead, bismuth amalgam injection HgCl_2 Mercury very little used at present		Skin and Inhalation of vapors and dusts Dermatitis
Anatomical preparation	Mercury used in coating Mercury may occur in bronze as a contamination of tin Mercury compounds used in the preparation of hair lotions and freckle preparations Hardening tools in mercury $\text{Hg}(\text{NO}_3)_2$ in dyeing woolen goods $\text{Hg}(\text{NO}_3)_2$ in making aniline red HgCl_2 used as a mordant HgCl_2 used for coloring Vermilion used as an inorganic dye Chlor-phenol-mercury and nitro-phenol-mercury HgCl_2 used in production		
Embalmers			
Backing of mirrors			
Glass globe coating			
Bronzing			
Cosmetics			
Hardening process			
Dyeing of woolen goods			
Manufacture of aniline red			
Printing of cotton goods			
Artificial flower making			
Color manufacture			
Mordants for seed			
Fuchsin			

tries in which mercury is used, the methods and type of hazard in each industry, and the manner in which mercury may be introduced into the body. It may be seen that mercury entails exposure of a considerable number of workers and represents a public health problem of some magnitude.

TOXICITY OF MERCURY

The introduction of mercury into the body may occur by 4 routes:

1. Inhalation of vapor or finely divided dust
2. Ingestion
3. Through the skin
4. Through the subcutaneous tissues

Industrial mercurialism occurs almost exclusively from the inhalation of the vapors of mercury or the dust of mercury compounds. The oral administration of metallic mercury is toxicologically unimportant. The toxicity of most of the salts of mercury is well known. Mercury is absorbed to a slight degree through the skin by way of the hair follicles and sweat glands.

The absorption of the inorganic compounds of mercury takes place chiefly through the digestive tract. Some of the organic derivatives of mercury, as dimethyl and diethyl compounds are volatile toxic substances. In industry the absorption of mercury through the subcutaneous tissues occurs only through an accident, as when thermometer bulbs or other glass instruments containing mercury are broken and penetrate the skin.

The toxicity of mercury and mercury compounds depends upon their physical-chemical properties, as the solubility, dissociation, and volatility, as well as upon the dosage, length of exposure, route of introduction, and individual sensitivity. Mercury locally has a caustic and irritant action.

Fulminate of mercury, used in the manufacture of detonators and percussion caps, produces chronic mercurialism, and also characteristic skin and

superficial mucous membrane lesions. The skin of the majority of persons employed in mixing, drying, filling, and preparing the fulminate shows these characteristic lesions. In 1930, 20 per cent of the mercury used in the United States was in the making of fulminate.

To indicate the manner in which chronic mercurialism can occur, I will utilize a considerable amount of the data collected by the Public Health Service in a study of the hatters' fur cutting industry,³ which entailed a study of approximately 500 workers exposed to mercury vapors and dust. This publication indicates the manner in which the public health aspects of chronic mercury poisoning may be evaluated, gives the characteristic symptoms of incipient mercurialism, and its prevention.

SYMPTOMATOLOGY

The symptomatology of chronic mercurialism falls into two types, one with stomatitis, colitis, and nephritis predominating, and the other with tremor and other neurological symptoms predominating. Many authorities are of the opinion that the intestinal, buccal, and renal symptoms are evidence of acute mercurial poisoning. According to Scopoli, Merget, and Biondi,⁴ mercury compounds taken into the body through the digestive system or parenterally circulate in the body in the form of a mercury chloro-albuminate or oxy-chloro-albuminate, and cause the lesions during the excretion through the kidneys, colon, and the salivary glands. Mercury taken into the body in the form of vapor circulates as such, or in other combinations, and gives rise to the nervous symptoms, tremor, spasms, crethism, and also to emaciation and cachexia. However, both forms of poisoning may occur simultaneously.

According to Biondi,⁴ when the mercury vapors in the air are of a

higher temperature than the mucosa of the respiratory tract, the mercury is condensed upon its surface and is then not absorbed in vapor form but as a combination similar to other mercury compounds. Under these circumstances the two forms of intoxication would be mixed, for not all of the vapor would condense and some would reach the mucous membranes at a lower temperature than that of the mucosa. In that case there would develop, besides tremor, spasms, erethism, and emaciation, at least stomatitis and even colitis and nephritis. While this is an interesting hypothesis and while there is no question that the two forms of mercurialism exist from a symptomatology viewpoint, it would be interesting to prove this by experimental investigation.

In the study of mercurialism among 529 fur cutters made by the U. S. Public Health Service in 1935 and 1936, it was found that the greater part of the mercury to which fur cutters were exposed was present as vapor and that a comparatively minor part was due to mercury-impregnated dust. Forty-three cases of mercurialism were found. The most important physical impairments were fine intention tremor, psychic disturbances, exaggerated knee jerks, vasomotor disturbances, simple inflammation of the nasal mucous membranes and conjunctivae, discolored oral mucous membranes, and gingivitis. Albumin, casts, erythrocytes, and leucocytes were found with about equal frequency in the urine of mercury-affected and non-affected workers.

Gingivitis (including both pyorrhea and gum inflammation in which pus exudation was not demonstrable) was somewhat more prevalent among persons with chronic mercurialism than among those not so diagnosed. However, the incidence of gingivitis had no direct relation to the degree of mercury

exposure, and was no greater in groups with a high mercury vapor exposure (over 2.5 mg. per 10 cu.m. of air) than it was for groups with a low mercury-vapor exposure who were employed for the same length of time.

It will be noted that the symptomatology in these 43 cases was of the neurological type, the outstanding symptom being intention tremor.

THRESHOLD DOSAGE

The quantity of mercury in the air which is sufficient to cause chronic mercurialism cannot be definitely stated. Age, sex, individual susceptibility, and the physical condition of the individual play some part in determining his reaction to mercury-vapor exposure. The largest amount of mercury is eliminated in the urine, and a lesser amount in the feces. Mercury is also eliminated in the saliva, sweat, and milk. According to Gutman, the urine may show mercury for months and even years after the metal intake. According to Young, Taylor, and Merritt,⁵ during the period of active urinary excretion, the mercury is found in rather high concentrations in the muscles, bones, liver, and kidneys, but following this the muscles and kidneys show only a trace and the concentration in the bone apparently remains unchanged. They conclude that mercury is stored in the bones and to a lesser extent in the liver, and that this storage is influenced by the pH of the diet, and the administration of acids or alkalis.

Borinski,⁶ in the Berlin Department of Health, found that human beings who have never come into contact with mercury may excrete up to 1/100 mg. of mercury a day. Nearly all important foodstuffs contain traces of mercury. Individuals who work with mercury daily, as dentists, laboratory workers, etc., show daily excretion up to 1/10 mg., and the possibility of mercury

intoxication should be considered in these individuals when they complain of so-called nervous disturbances.⁶

Göthlin⁷ states that 0.4 to 1 mg. of mercury inhaled daily in the form of vapor causes chronic mercurialism. Turner⁸ states that 0.771 to 1.285 mg. of mercury absorbed daily will produce symptoms of mercurialism. Fraser⁹ found in dogs that a concentration of 1.89 mg. of mercury to 1 cu.m. of air inhaled 8 hours daily for 40 days caused no evidence of mercurialism, and that the minimum concentration of mercury leading to intoxication was 3.05 mg. to 1 cu.m. of air. The Leningrad Institute of Organization for the Protection of Labor permits only traces of mercury in the air. In the study of mercurialism among fur cutters, the Public Health Service found that the symptoms of chronic mercurialism developed among individuals working in atmospheric concentrations ranging from 0.6 to 7.2 mg. per cu.m. of air, also that the severity of chronic mercurial poisoning and the percentage of persons affected increased with the degree of exposure. The incidence of chronic mercurialism increases rapidly with increasing mercury concentration after the concentration exceeds 2.0 mg. per 10 cu.m. For instance, of the 377 persons exposed to 2.0 mg. or less per 10 cu. m. at the time of the study, 4.5 per cent were diagnosed as having chronic mercurialism, and of the 152 persons exposed to greater concentration, 17.1 per cent were so diagnosed.

DIAGNOSIS OF CHRONIC MERCURIALISM

The diagnosis of chronic mercurialism (industrial) depends upon a careful physical examination, which includes a thorough occupational history: (1) the individual's present occupation, and the length of time he has been engaged in it; (2) a record of all the occupations he has been employed in from the time he first began to work; and

(3) an estimate of the total time he was employed. The physician should know the occupations in which there is a mercury hazard. An occupational analysis by trained engineers is usually necessary in order to determine the exact occupational exposure. The industrial hygiene sections of several of the states have personnel who are prepared to make such analyses.

In the medical history, complaints of diseases of the nervous system, psychic disturbances, digestive disturbances, insomnia, loss of appetite, tremor, loss of weight, sore mouth, and weakness should be especially noted.

The following conditions should be especially noted: pallor, simple inflammation of the nasal mucous membrane, gingivitis and pyorrhea, discoloration of the mucous membranes, excessive salivary flow, dark line on the gums, stomatitis, fine intention tremor of hands, fingers, eyelids, and tongue, shaky hand-writing, speech defect, psychic irritability as shown by irascible temper, discouragement without cause, feeling of discouragement or despondency, excessive embarrassment in the presence of strangers, anxiety and excitability, exaggerated knee jerks and vasomotor disturbances such as excessive perspiration, abnormal blushing, and dermatographia.

Routine examinations should be made of the urine, looking for evidence of renal pathology. Twenty-four hour specimens of urine should be analyzed for mercury. In our fur cutting study the quantitative spectrographic method was found to be the most practical and accurate method for this analysis. The presence of mercury in the urine is not necessarily a symptom of chronic mercurialism, it can only be regarded as proof of mercury absorption.

It is hoped that in the near future a spectrographic method will be worked out for the determination of mercury in blood. A complete hematological

examination should be made; however, no one finding can be considered *per se*, as definite, positive evidence of mercurialism, as will be shown by the blood picture findings in the fur cutting industry. The erythrocyte count was slightly lower in those with chronic mercurialism than in the nonaffected individuals. Persons with the symptoms of chronic mercurialism had almost the same hemoglobin index and total leucocyte count as those who did not have these symptoms. The difference between the reticulocyte percentage of the mercury-affected and nonaffected males was 0.2370 ± 0.1074 , which was possibly, but not certainly statistically significant. The mean values for both groups were slightly higher than normal.

Other cytological data collected as stipple cell and blood platelet estimations, had little diagnostic value as far as chronic mercurialism was concerned.

The percentages of lymphocytes found in the blood of these fur cutters were slightly higher than usual and the percentages of neutrophils were correspondingly lower than usual. Although the interpretation of these differences was complicated by several circumstances which could not be controlled, it appeared that they were not necessarily the result of mercury absorption. The fact that the monocyte percentages were within normal limits substantiated this view.

PREVENTION OF INDUSTRIAL MERCURIALISM

The prevention consists primarily in the avoiding of the inhalation of mercury vapors and dusts. This is an engineering as well as a medical problem, requiring special local exhaust ventilation, good natural and mechanical ventilation, good housekeeping, and general sanitation, and in certain occupations positive pressure masks.

From a public health standpoint it is essential to determine the extent of a

hazard and to develop methods which can be employed for its control. In its study of the hatters' fur industry, the Public Health Service surveyed all of the plants in the United States, which employed approximately 2,000 persons. These workers were further analyzed according to occupation and from such preliminary data it was possible to determine the number exposed to fur which had been treated with mercury, and to determine the extent of the mercury hazard in this industry.

Following the occupational analysis, a study was made of each occupational environment and determination of the amount of mercury vapors to which the worker was exposed. It was necessary to obtain dust samples to determine the amount of mercury in this form which was inhaled. The evaluation of the industrial environment is of use in obtaining an estimate of the relative degree of mercury hazard associated with each occupation, and, where control is used, its effectiveness. In studies of the health of industrial workers the quantitative data with respect to each occupation have shown a high degree of correlation with medical findings. Quantitative estimates of the amount of contamination present in the air are also a measure of the effectiveness of control methods as Table II indicates.

From a medical viewpoint it is necessary to make periodic medical examinations of individuals exposed to a mercury hazard, paying particular attention to the symptom complex of mercurialism, as outlined.

Mild, early causes of chronic mercurialism, characterized by fine intention tremor of the hands or fingers, and slight evidence of psychic irritability, can be discovered during periodic medical examinations and the workers removed from their mercury exposure. They usually recover in a short time under symptomatic treatment, and

TABLE II

Exposure of Hatters' Fur Workers to Mercury Vapor and Treated Fur Dust Under Controlled and Uncontrolled Conditions

*Total Mercury Exposure in
Milligrams per 10 Cubic
Meters*

Occupation	Total Mercury Exposure in Milligrams per 10 Cubic Meters		Method of Control
	Uncontrolled	Controlled	
Drummers	2.5	0.6	Segregation
Clippers	1.5	0.7	"
Brushers	3.1	1.2	Local exhaust ventilation
Cutters	4.0	1.8	" " "
Sorters *	3.8	1.7	" " "
Blowers	4.6	0.7	" " "
Pilers	5.4	Trace	Good natural ventilation
Storage workers and shippers	7.2	Trace	" " "

* Depend on exhausts installed on cutting machines.

should not be returned to their old occupation until the mercury hazard has been controlled.

Patients with severe chronic mercurialism, characterized by intention tremor of a marked degree, erethism, denoted by a continuous irritability, and pronounced vasomotor changes, are completely disabled for any work, and require months of careful medical and nursing care.

It may be seen from the foregoing that the public health problem with regard to chronic mercurialism is one of preventing mercury from being ingested or inhaled by the worker. Its prevention from the engineering standpoint is one of providing a sanitary and healthful environment, and from the medical one of recognizing early

symptoms. Chronic industrial mercurialism is preventable with good engineering and medical control.

REFERENCES

1. Ramazzini, B. *Diseases of Artificers*. Translated by R. James, M.D. 1750.
2. Dublin, L. I., and Vane, R. J. Occupation Hazards and Diagnostic Signs. Bureau of Labor Statistics Bull. 582.
3. A Study of Chronic Mercurialism in the Hatters' Fur Cutting Industry. *Pub. Health Bull.* 231.
4. Biondi, C. *Arch. f. Gewerbepath. u. Gewerbehyg.*, 1:754-762, 1930.
5. Young, A. G., Taylor, F. H. L., and Merritt, H. H. The Distribution and Excretion of Mercury. *Arch. Dermat. & Syph.*, 21:539-551, 1930.
6. Borinski, P., quoted by Leschke. *Clinical Toxicology*. English translation by Stewart and Dorrer. 1934.
7. Göthlin, G. F. *Hygiensk Tidskrift*, 1909 (cited by Flury and Zernik).
8. Turner, J. A. Mercurial Poisoning. *Pub. Health Rep.*, 39:329, 1924.
9. Fraser, A. M., Melville, K. I., and Stehle, R. L. Mercury Laden Air: the Toxic Concentration, the Proportion Absorbed, and the Urinary Excretion. *J. Indust. Hyg.*, 16:77-91, 1934.

Edward Jenner Memorabilia

JENNERVILLE, Pa., was named after Dr. Edward Jenner of Berkeley, Gloucestershire, England, by Dr. Francis Allison who lived in this hamlet of Chester County between 1839 and 1859. An exhibit of portraits of Edward Jenner and other memorabilia has been in existence for years in a

brick mansion built in 1740, located on Route 1 and now known as the Red Rose Inn.

Among the exhibits is a declaration attesting the appreciation of local residents for the priceless discovery of the method of vaccination against smallpox.

The Case of Public Health vs. Public Welfare*

HOMER FOLKS, LL.D., F.A.P.H.A.

Secretary, State Charities Aid Association, New York, N. Y.

THE subject which is printed by my name is possibly a little mystifying to you, "The Case of Public Health vs. Public Welfare." It is a little mystifying to me, too, though I had a fairly clear notion of what was in my mind when I suggested it. That poverty and disease have very close interrelations of cause and effect, that we are bound to find many matters of common interest between the agencies and the persons dealing with them, is, of course, a commonplace. It has been set forth at these meetings perhaps more fully and more convincingly than ever before. Except for the period of depression we are now passing through, it has been an axiom that sickness produced more poverty than any other one cause.

The finest account of the historical development of the relations between the authorities dealing with health, public health in the sense that we use the word ordinarily, and poverty, is contained in Sir Arthur Newsholme's last book, *The Last Thirty Years in Public Health*.† About the first third of that is devoted to what is to me a very fascinating but fully clear, objectively stated, and convincing statement of what has actually occurred in Great Britain as between those two subjects,

as to important legislation, and as to administration, over the last quarter of a century.

I strongly recommend that each of you, whether health officer, social worker, or public health nurse—however you are interested in the subject—read that book.

I will not try to discuss that total general picture, because it has been done repeatedly. It is a thing that is going to be worked out in practice by actual effort rather than in the seclusion of the library or in the bill drafting departments of Congress or of state legislatures. I will speak of only a few phases of it, bringing to you a rather unassorted miscellaneous group of thoughts and comments. I am, so to speak, bringing the public welfare official and the public health official into court and putting a few questions to them.

The first thought that occurs to me is one that is familiar to many of you, no doubt. That is, that public health as an organized movement in English speaking countries is the direct outcome and the actual child of the Poor Law Administration. It is rather important, I think, to bear that in mind and to get the origins of things somewhat clear.

In 1834 there was a great wave of interest in the Poor Law in Great Britain, as you know, and one of the most classic and celebrated government

* Read at a Special Session "Public Health Today," of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

† Obtainable through the A.P.H.A. Book Service.

reports of all times, that of a Royal Commission on the Poor Law, was submitted in 1834. The main author of that report was one Mr. Edwin Chadwick, who later became Sir Edwin Chadwick, and, as sometimes happens after a thing is put over, he found himself as the executive charged with carrying out the new provisions of the new Poor Law for Great Britain, which he had outlined and mainly written.

He came at the thing from a somewhat new point of view. He was a political economist, one of the early ones, one of the fully convinced ones. Quite soon in the course of his management of the Poor Law Administration, of bringing about some coördination and some national supervision of the Poor Law Administration by local authorities, there was a great epidemic in London. There were several of them as a matter of fact, but there was one very notable one of cholera, and the only protection that was then thought of was to meet in the churches for prayer.

Sir Edwin thought more could be done than that, and he put a question (it recurred to him and it worried him) to his bosses, the Poor Law Board: "Wouldn't it be cheaper and better to restrain epidemics than to go on taking care of so many widows and orphans? Shouldn't we, the Poor Law Board, get busy on this question of preventing these recurring epidemics which cost us, for so many years after, such enormous sums of money?"

If you recall the history, the Poor Law Board, eminent people, said in substance, "Well now, you just lay off on that business that you are talking about. That is none of your affair. Our job is to take care of the poor. Somebody else has to do what is to be done, if anything can be done, about what you are talking about."

But he was a very persistent fellow. He was a cantankerous, obstinate kind

of a man who never knew when he was licked. So he kept on, and he appealed to the government of the time being to take up the question. His bosses got very angry when he went over their heads, and before long he lost his job as the executive of the Poor Law Board of Great Britain.

But his views prevailed, for about that time, in the late 1840's (the great Poor Law reform was in 1834), the government listened to him. They created, in 1848, the first national authority dealing with public health in Great Britain. Mr. Chadwick then, having lost his Poor Law job, was put in charge of the new Board of Health, created as the result of his interest and his agitation of the subject.

I wish to nail down one fact—that the proposal to establish a national health authority, though it emanated from the former chief executive of the Poor Law Board, did not propose that the new health authority should have anything particular to do with or about those who were subjects of relief in Great Britain. Quite the contrary, it was to deal with the whole community. It was going to deal with the entire population. It set out specifically to deal with the causes which produce poverty. It intended to keep other people, not then destitute, from being forced to join the ranks of the indigent. It did not contemplate any special action or provision for those who were already on relief.

Jumping from 1848 to 1937, we find ourselves, in this country, in this state, and particularly in this city, faced with the proposal that the work of the public health authority, in his efforts to prevent communicable diseases, and in the diagnosis and care of communicable diseases (and diagnosis and care are essential factors in the prevention of such diseases) should limit his services and his efforts to those persons who are indigent. This, to the

best of my knowledge, is a new proposal in public health work in this or any other country. In the light of its historical setting and, above all, in its bearing upon the future of the public health movement, it is an exceedingly serious proposal. It is by no means just a dispute about official jurisdiction over particular activities. It goes to the very root of the public health movement, its objectives, its underlying purpose, and its possibilities for public well-being. It should not be accepted without the most careful consideration.

That is the issue between public health and public relief which I wish to discuss today. I spoke of it in the title of this talk, as the case of Public Health vs. Public Welfare, because if the principles of public welfare administration, which by definition deal with the indigent, are to be extended to public health activities, then public welfare will have done public health and public well-being more serious harm than all the great benefit which it has previously contributed to the public health movement. I will state 7 considerations in support of this opinion.

1. The first point is that, as I have just shown, the new proposal is flatly contrary to the origin, spirit, and trend of the public health movement up to now.

2. The second point is that it is flatly contrary to the present program in those countries which have actually succeeded in achieving a high degree of success in dealing with a major public health problem—the control of syphilis. I refer to the report of a recent commission from this city, which investigated this subject, consisting of the Commissioner of Health of this city, a representative of the 5 County Medical Societies here, a representative of the State Medical Society, and of the U. S. Public Health Service, which states in its General Conclusions that among the facts generally believed to be the most

important in syphilis control in the Scandinavian countries and in Great Britain is "the fact that in all of these countries diagnosis and treatment are free, accessible, and generally good." The commission adds, "In all these countries diagnosis and treatment are free to all without economic distinction." In entering for the first time upon a really concerted nation-wide movement to control syphilis, would it not be indefensible to ignore and, in fact, to proceed directly counter to, a principle which, in the opinion of such authorities, has been of prime importance in the notable success secured in these 4 countries.

3. My third point is that to limit the scope of the public health authority to indigents would be a departure from the practice of every department of municipal government, except only that department which has been specifically created to deal with indigents. It is possible to talk so much about the indigents as to gain an impression that public services generally are for the special benefit of the indigent. Nothing could be further from the case. Public services, almost without exception, are for the benefit of the entire public, and deal with the people as a whole, and as individuals, without reference to their economic status. These public services could have been set up conceivably upon a different basis; but they were not, and no one, so far as I know, has proposed that they should be. Take a look for a moment at a few of the major services of a municipality.

There is the fire department. If my house takes fire, I send a call to the fire department, and it very promptly comes to my rescue. The fireman is a curious type of person. He has a single track mind and is dominated by only one idea. When he arrives, he does not say "Good morning" and chat with me and my family for a few minutes, to cultivate useful contacts for the future.

He asks only one question—"Where is the fire?" His manners are bad; he is terribly direct in his approach; he runs all over my place with his muddy boots; he takes his muddy hose up the stairway and chops through the side of the wall, or into the roof. He does anything and everything, regardless, in order to get water on the fire at the right time, in the right place, and enough of it to put the fire out. But he is a great success in putting out fires. I have sometimes thought it would be a good thing if all health officers, before they were appointed, were required for a couple of weeks to ride the fire engine, and see how the fireman tackles his job—for fires also are catching. Fires can be put out by water, but it requires skill to get water to the right place, at the right time, and enough of it. Syphilis can be put out with arsenic and bismuth, but they must be applied in the right place at the right time, and in the right amounts. The important thing is the result, not the economic status of the person having the communicable fire or disease. But fires are all the fireman is concerned with. He does not stop a minute when I send the call, or when he arrives, or while he is putting the fire out, to ask whether I will be able to pay for his service. Of course I probably could pay for it, if the city should send me a bill. As a matter of fact, I do pay my share of putting out all the fires in the city whether my own house takes fire or not. Each year my tax bill includes my share as a taxpayer of the cost of putting out fires, but the service is free to any and all when the fire gong rings.

The police of my city watch over my house when I am away for the summer, or at any other time. They take a look at it nearly every day. When I return, unless I think to notify them, I am only in my house for a very few hours before the policeman knocks at the door to see if I am home, or

whether some person has broken in. The police department never sends me any bill for these services. I could pay for it directly, but I pay for my share of it in the tax bill, as does every other resident of the city. I am not expected to hire a private watchman of my own, though possibly I might be able to do so. That is not the way public service is organized.

The park and playgrounds of this city, and of every city, are open to all comers. There are no parks and playgrounds set aside for the indigent, for their particular use and benefit. Nobody inquires as to how many of the people using the parks and playgrounds could pay for that privilege.

Public housing provision has been a very active subject in the last few years. The federal government, the individual states, and the municipalities, by one plan or another, have built many apartment houses, or individual houses in groups. No one, I think, has had the hardihood to suggest that any one of these provisions should be set apart for the indigent only. It is difficult to think of a suggestion which would be more generally unpopular. They are for persons of limited income to be sure, but that is a very much larger group. They may be occupied in part by people who receive relief money, from which the rent is paid, but never exclusively by such persons.

There was once, in 1820 in New York State, a suggestion that all those receiving public relief should be brought together in one housing provision in each municipality, or county. It was maintained that the indigent would receive better care; that children would be better trained: they could more readily be provided with work. It sounded good. Such a law was passed. Logically, this common housing of the indigent was called "a poor house." Its history is known to all. Its development was the most outstanding failure

of any public enterprise ever undertaken. The indigent do not wish to be grouped together. They bring to each other only humiliation and despair.

Education, of course, is the great outstanding instance of a public service, open to all, availed of by practically everybody, and paid for by those able to pay and in proportion to their ability to pay.

As public health workers, we should hesitate long before accepting for the public health authority a completely different basis of administration and action from that of practically all other municipal departments.

4. My fourth point is that a public health service for indigents would inevitably fail to attract any considerable public interest, or to be granted any considerable private or public support. This is, in fact, a matter of great moment. The public health authority has been given legal powers quite beyond those of any other department, and public funds to meet any emergency, *because* it is generally understood to be protecting the health of *all* the people. What a different appeal any health agency would be making if it were clear that it would deal only with indigency. How far, for instance, would a National Association for the Study and Prevention of Tuberculosis among Indigents have gotten as compared with the tremendous organization and great resources of the National Tuberculosis Association for everybody? What would an American Association for the Health of Indigent Children have been able to accomplish? How far would Col. Snow have been able to get if he had established an American Association for Social Hygiene among Indigents? How far would *any* public health department get if it were in name and in fact a department for the protection of the health of the indigent? It would have no appeal to the imagination; it would speedily reach

the status to which it would be entitled, and to which it would properly belong, that of a medical bureau in the Department of Public Welfare.

5. My fifth objection to limiting any public health service to the indigent is that, speaking broadly, there is no such group. There are a great many people who were indigent yesterday, but are self-supporting today, even though they may be indigent again tomorrow. The rapid turnover of the relief rolls all through the depression has been one of its chief characteristics. People are on and off the relief rolls, and on and off again, as the changing tide of employment or of good fortune may affect them. Over a period of years, there are enormous variations in the number of the indigent, using that term in its ordinary sense. In 1929, there were no public indigents, and only a few private indigents, in New York City. Four years later 20 per cent of the population were indigent. The percentage has wide swings up and down. No health program can be built on such a shifting basis. Both tuberculosis and syphilis require long-term planning and long-term care. The shifting of the individual patient to and from the status of indigency has no conceivable relation to the care he needs, and, above all, no relation to the steps that need to be taken in relation to him, to prevent other people from being infected by him.

But apart from the shifts in the ranks of the needy, there is no generally accepted test as to what constitutes indigency. Is an old age security allowance, though based on need, a form of indigency? Is a so-called extended unemployment benefit, though based on need, a proof of indigency? Are widows' pensions, though granted on a relief basis, for the indigent? You might think so, but we are spending hundreds of millions of dollars each year in these United States to prove the contrary,

and the people believe the contrary.

On the other hand, it is even more true that huge numbers, millions in fact, of those whom we call non-indigent and self-supporting, are not in truth, and in reality, self-supporting. They are not supported in any fair sense of the word, either by themselves or by anybody else. Their standard of living is so desperately low that they do not really support themselves, they merely continue to exist in a poor dying way. Truly, they need health provision desperately, but they are not in the ranks of the indigent; they are not on the relief rolls. No one can look at these fundamental facts about the economic status of the people of America without realizing that there is no basis for a public health program anywhere, at any time, in attempting to draw a distinction between the indigent and the non-indigent.

6. For my sixth point, let us push this thought one stage further. Dr. Lee K. Frankel, a true statesman in social welfare and public health, and a great leader in this American Public Health Association just 10 years ago, stated on several occasions that unless conditions changed, the end of poverty and of the need of relief was in sight. He said that the great family welfare societies of New York City, would be able within a few years, unless trends changed, to devote all their funds and all their efforts to providing education, recreation, and generally a higher standard of living among those with low incomes, for there would be no further occasion for material relief. He was speaking primarily of the people of this city. Of course, conditions *did* change, and his prophecy seems now somewhat grotesque. It would be a great mistake, however, to think that he was not fundamentally justified in 1927. In fact, I have no considerable doubt that the attainment of what he foresaw then, a few years ago, has been simply post-

poned and by no means abandoned. I think we have arrived at an American policy in regard to poverty. It consists of two major elements: (1) the preventable causes of poverty will be prevented; (2) non-preventable poverty will be called something else, and dealt with by different methods and on a different basis.

I say all this to raise the underlying health question. If there should be no indigency in a few years, will there be no need for public health and no health authority? The question answers itself. It is inconceivable that we should not have a stronger and a more efficient public health authority under such circumstances. We could afford to do more for health, and there are endless areas to be covered, innumerable things to be done, before we have prevented all preventable illness.

7. My seventh point is that the methods and objectives of public health and of public relief are different fundamentally and also from the point of view of the psychology of the public, and are wholly incompatible with any identification of the two subjects. Poverty is something which everyone dreads, everyone seeks to avoid, every welfare authority seeks to limit, in the area of its application. Poverty is excessively unpopular. The public mind is set against it. Those on relief naturally and properly make every effort to conceal the fact. Health, on the other hand, is something which everyone desires and desires more strongly than anything else. It is a goal toward which everyone strives. It is cherished next to life itself, and occasionally even life seems undesirable without health. Health promotion takes on wider vistas with every new scientific discovery. Public health seeks to make available that ever increasing area of health facilities which the individual cannot afford, and that area of protection the individual cannot provide for himself. Yoked to

indigency, health would be on the way out. Anchored to the community as a whole, health is on the way in.

RELIEF AND HEALTH

For these seven reasons, then (and there are plenty of others), it is apparent to me that relief and health, although on the same highway, are moving in opposite directions. The more efficient either or both of them become, the farther apart they are. The destination of one is universality; the destination of the other is disappearance. These destinations are as far apart as East and West, and "East is East, and West is West, and never the twain shall meet."

PREVENTIVE MEDICINE

It is implied in what I have said that I am dealing with public health in the older and more limited sense of *preventive* medicine. I deem that an exceedingly important point, and I hold the position that it is not only possible but exceedingly important, not to get preventive public health confused with the whole question of medical care.

Sir Arthur Newsholme¹ in his paper a day or two ago—and he is the man from whom I have learned more about public health than from anybody else—referred to preventive medicine and clinical medicine as being Siamese twins. Even Sir Arthur might be mistaken once, you know. I hope he is mistaken, for I have always felt that to be a Siamese twin was one of the least desirable of all possible modes of living.

In the first place, twins are apt to be much alike, physically, mentally, and emotionally. You expect twins to be alike. But public health organization is very different in many respects from the practice of medicine. For one thing, the public health official wears peace-

fully, or even proudly, the badge of public office—of serving the whole community, as part of the government, of fighting disease wherever it is, and not only in some selected sector.

On the other hand, you all know that if you are in a medical society, you must be very careful about mentioning government at all, because there might be explosions, mishaps, and other unforeseen things like that. In other words, there are reactions, emotional, mental, and temperamental, which are very different. So they can't be twins—clinical and preventive medicine. That is, they don't look alike, and they don't act alike, and they don't think alike.

A second thing is, I think, conclusive. Twins have to be born at about the same time. There can be a little lag, I believe, between twins—as to the hour of birth—but it can't be very long. Sir Arthur said that the public health movement was a little less than 100 years old; the practice of medicine, as you all know, began around 400 B.C. You could not have a lag of 2,200 years between the birth of twins, could you?

So, I prefer to see these two great services, for the present and for some time to come, one chiefly governmental and one chiefly individual, each established on its own feet, without trying to act like twins; each having its own normal development, each serving its purpose, each accumulating its own experience, each adjusting itself to the needs of the community from time to time. I do not want to see at this time any attempt to merge things that are as different as public health, a governmental service, and the private practice of medicine. That may come in the future, but not yet, nor soon.

REFERENCE

1. Newsholme, Sir Arthur. The Health Department in the Field of Medicine. *A.J.P.H.*, 27, 11:1089 (Nov.), 1937.

The Health Department in the Field of Medicine

From the Standpoint of a Private Practitioner*

CHARLES H. GOODRICH, M.D.

President, Medical Society, State of New York, Brooklyn, N. Y.

THE potentialities of preventive medicine have developed almost as amazingly in the past few decades as have medical diagnosis, surgical technique, and endocrinology. This as a part of the daily, commonplace realization of medical health department workers. To the rank and file of practicing physicians these potentialities are dreams, imponderables. When we first suggested an aggressive program to incite interest and undertaking in preventive medicine, an eminent metropolitan surgeon with an unusually broad knowledge of medicine in general remarked "There is little we can do about it for it is summed up in the use of a few specific vaccines and serums." Per contra, health department workers are almost as astonished as are newspaper editors when they hear of medical cures or successful surgical operations which are ordinary occurrences in medical practice. We do not understand each other well enough to benefit our people with an adequacy of service comparable with our conjoined abilities in a state of fusion.

Theodore Roosevelt once said "'Together' is the grandest word in the

English language." Mutual understanding and endeavor are resultant implications and should be translated into accomplishments. To do this we must be frank with each other. We know intimately a married pair who seldom have impatient words with one another, but when the servants irritate and disturb the wife, she relates eloquently to the husband their shortcomings, mistakes, or impertinences. He has, after patient listening, uttered the stereotyped kindly response "What good will it do to scold me? Why not tell *them* about it?" In kind, when we have shortcomings tell *us* about it—not your associates. We are learning to tell you when policies or actions seem shortsighted, ineffectual, or unjust, and are instructed and gratified with the courtesy and coöperation in your response.

During the meeting of the Sixth District Branch in Owego on September 21 the presidential address was captioned "Preventive Medicine and Tuberculosis." Therein we indulged in the following fantasy—"In organizing a renewal of the campaign for the prevention of early tuberculosis compare our 'man-power' to that of a foot-ball team. The health departments, financed and directed by the state and local governments, furnish the runners who cover much ground, the

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

half-backs and full-backs, and the quarter-back who calls the signals. What can they do against the 5,000 year old tubercle bacilli deployed all over the field, without a strong scrimmage line? With the general practitioner as center-rush, roentgenologists as guards, surgeons at tackle, and specialists on the ends, we may have some chance of winning. Hearty coöperation is therefore most desirable." This illustrates our dream of coöperation in this line of work.

Physicians think that health department officials and doctors of public health who have regular hours, 9 to 4, or 9 to 5, good salaries, offices and equipment furnished, and with no professional expenses, proceed to undermine the practitioner of medicine who has long hours, irregular sleep, often broken or abolished for 24 to 48 hours, no salary, often large earnings with heavy expense and scanty collections. They believe public health doctors do not see anything of many dangers hanging over the people and pay no attention to physicians' warnings. They have a close view of illness and prevention and a close view of tragic happenings.

Public health doctors think—physicians roll around town luxuriously making largely social calls for large fees, really do little work, have no interest or patience with health department matters, especially those most important affairs in which health departments dominate but need physicians' coöperation. They lack adequate appreciation of the great work of the great mass of physicians and surgeons. Theirs is an aeroplane view of disease and prevention with little or no personal experience with tragedies of life except as read through collected and carefully arrayed statistics.

When we realize how few practising physicians attend a convention like this or conferences of health officers, and how few health officials are regular

attendants at their county medical society, state society, or national meetings, we comprehend that in general the scope of vision in matters mutual are naturally restricted. However, there are bright spots which we can consider as exceptional and happy examples of what can happen. The secretary of the Medical Society of the State of Kentucky is the State Commissioner of Health. It is evident that your Association regards this ambidextrous gentleman with approval for you have selected him as your next President. In Alabama the State Medical Society is the Health Department and selects the Commissioner. Any one who has had the privilege of knowing and appreciating the qualifications and accomplishments of the present Commissioner of Health in Alabama will join us in felicitating that state upon its health arrangements. Undoubtedly health departments, under the present magnification of party politics, cannot always be under such ideal direction; for lay government is not infallible in its knowledge of scientific qualifications. In New York State and in New York City we have been and are now most fortunate.

Locally if a health officer is an active member of his county society and in frequent conference with its officers and committees, health matters proceed with notable satisfaction. We have discovered several such localities in our official visits to districts in this state. Where the health department and the county society each "goes it alone" separately in health matters, both grumble more or less about the conduct of the other. They should work together. Objectives are identical—why not coöperation?

In order to fulfil our obligations upon this program we are supposed to discover some of the "encroachments on medical practice" by health departments. If we were narrow enough to

define the word "encroachment" with meticulous accuracy we could say that nearly all health department activities are encroachments. However, as we recognize that "generally accepted custom makes law" (as well as language), and as physicians of the past have approved of the building up of the health departments' provisions in mass preventive medicine and custodial care, we inherit these regulations, with gratitude for the efficiency which has been demonstrated. As physicians we wonder if this efficiency would not be enlarged if our coöperation were habitually sought before plans are made and activities started, as has been notably the case in this state in the programs for controlling syphilis and pneumonia.

Some encroachments exist which are largely sporadic and local or personal, usually with the complete innocence or ignorance of clear principles by the subordinate officer in charge. An example far from here:

A health officer who is also a school inspector referred so many children with a certain type of ailment to physicians and consultants of his state department for *treatment*, that the people of that community came to believe that this was the best way to have such cases managed and, regardless of the capacity of parents to pay, demanded that their children have the same free care. When it was called to his attention by local physicians he said he was helpless—that the people demanded it, and he dare not change else he would lose his position.

In general, we believe that whatever may rightly be called encroachments upon medical practice are largely due to the limited knowledge of the majority of practitioners concerning the technique of disease prevention (except in specific prevention, as in smallpox, diphtheria, typhoid, tetanus, etc.), balanced by the limited appreciation of health officers and associates of how

earnestly and devotedly physicians in general work for their people. The remedies: For the general practitioner, awaken his interest and train him in preventive medicine. For the health officer, advise him to join and work in his county, state and national medical societies so that he will understand the spirit of practising physicians and, combining their viewpoint with his own, become more useful and accomplished. In other words, develop more McCormacks and Bakers.

We believe that centralized clinics for the administering of specific remedies for prevention and for other preventive activities could wisely be replaced by sending this work to physicians' offices with payments for the physicians, on condition that the county medical society members accept guidance by the department, as in the Detroit plan. Some say this is more expensive. It is; but it would recompense the community to have every physician beneficently compelled to interest himself in prevention, whereas, the multiplication of centralized clinics tends to cause an increasing atrophy of interest on the part of physicians. It is the social effect upon them and the community that reduces the proper advantage to the community that is far more important than the small returns in dollars. As in remedial services to the indigent, the community by paying the physicians for care of the indigent will be commensurately rewarded, for, as has been wisely remarked by F. E. Elliott:

"Every community has a vital stake or resource in the financial prosperity of its physicians." They must not occupy their minds with worries about how to exist and support their families.

Surely, as our great Surgeon General has said, "The taxpayers will determine how much they will pay for health service."

The taxpayers *can* be made to under-

stand the need of greater appropriations for health work. Henry Vaughan has done it, and it should be accomplished everywhere not only for the purposes above mentioned, but also because the salaries of physicians who are health department officials are grossly inadequate, when we consider the required time given to preparation and training. The health department of a city is quite as important as the fire department; yet we are informed by credible authority that the mere change of the firemen in this city to a 3 platoon system involves a larger expenditure per year than the *entire* appropriation for the health department. You can rebuild burned houses! Should we watch undisturbed the destruction of human lives because of scrimping appropriations?

In general we believe that *treatment* of all conditions, when patients are not under custodial care by governments, should be referred to private physicians. For instance, competitive treatment clinics should be avoided in venereal disease work. Diagnostic clinics? Yes! Treatment—No! As soon as the state or community takes this over many physicians are not interested, and the physician's office is the look-out station for such cases. In the current war on syphilis inaugurated by Surgeon General Parran while Health Commissioner in New York State with the coöperation of the State Medical Society, every possible effort to comply with this principle is made. However, it would be a wise provision in such instances to have all physicians so treating such cases qualified by their county society and made amenable to regulations made by the county society and the department. In other words, not every physician is trained and qualified to treat syphilis efficiently. If this work is to be distributed, only trained and qualified men should be utilized. The approved roentgenologists should

be generally used in X-ray case finding in tuberculosis and their services available daily throughout the year. The occasional spasmodic attacks by various health organizations using commercial laboratories or technicians is entirely inadequate. Health department diagnostic clinics for the indigent, and in rounding up of contacts, are of course necessary in many areas, and we understand that competent roentgenologists are the interpreters and consultants. The best talent we have is none too good or too expensive in this service.

State subsidized laboratories of pathology, bacteriology, and serology are reputed to be providing unfair competition for private laboratories in that gratuitous services are given to those competent to pay, or substandard fees are charged. The contention that such laboratories should adhere to charges mutually agreed upon in non-indigents seems reasonable. Some prominent gifted laboratory directors feel that there is great danger to private practitioners along this line, and great disheartening of young practitioners. We quote one of these:

"From my own viewpoint as director of a private clinical pathological laboratory, I can assert that the State Department of Health, through the State Laboratory and State Subsidized County Laboratories, offers most unfair competition. They are eager to furnish free laboratory service to any patient when requested by a private practicing physician or surgeon. Here the latter are short-sighted because every time they call a State Health Department man in and secure free consultation service, they are aiding in the destruction of the practice of private clinical pathology. If they succeed in destroying this branch of medicine as a private enterprise, they will next try to take over medicine and surgery (which they are already doing in certain areas). They will ultimately reach their goal of obtaining complete control of medical practice by destroying all private practice. We can then look back at events that have happened and thank ourselves for supporting their endeavors."

This physician is a fine citizen and a medical leader in his section and his state. Can we disregard his expressed opinion? We know that with present appropriations control of all medical practice in his state would not be possible. However, he has had some discouraging experiences and we hope that he has already conferred on the laboratory matter.

We need more constructive mutual thought and coöperation, and our urging that "Every practising physician should be a deputy health officer," means just what it said and *was* unanimously approved by the State Medical Society. In this action we are pleased to offer our opinions, our counsel, and our services to health authorities. We believe that this can be duplicated in all states if the genuine desire for service to the people pervades practitioners and health department groups.

We must agree that maximum efficiency in health matters must prevail. Working together is the accepted formula therefore hereabouts.

We believe that periodic health examinations of the apparently well person is the heart of the preventive medicine which falls to the duty of practitioners. There is meager demand for it by the public. Health departments with their many contacts extending out into the realm of the visiting nurses and the child welfare stations can do wonders toward enthusing the public over this regular inspection and record. We believe accurate permanent records are essential to ultimate ideal success. Ward Crampton believes that a hundred years from now each candidate for periodic health examination should be able to lay before his examiner the records of his great grandparents. Is this such an idle dream? Think of the disabilities and lives saved all along the century! We can all assure the people that such complete examination will be competent insurance against

a definite proportion of prevalent diseases which are sneaking up behind them unnoticed or their *apparently* trifling symptoms disregarded. Or, as in cancer, where the duration of the growth is often in doubt, patient and physician can be sure that its inception dates from some time after the last periodic examination record.

This is one way in which you may help us to prevent disease with the use of forces and people at your command.

Tell us how we can help you! We realize that the license to practise medicine implies other obligations than the diagnosis and treatment of disease. I would not be here today if this were not true. With the knowledge the state has proved we possess, we should not be merely the audience when the play "Prevention" is staged. Tell us how we can help you! Integrate us into your systems wherever it is possible, remembering and asking taxpayers to remember, that the majority of practising physicians live on a smaller income than the average of the inadequate salaries of health department physicians—and the majority of these physicians deliver first class service in stout-hearted self-sacrificing spirit without regard to hours or convenience.

Here, as elsewhere, there is strength added in union of efforts and "Together" should be our motto.

There is one final point which must be frankly disposed of. Health departments, welfare agencies, and other public health organizations, on the one hand, and the medical profession on the other, all contain a certain very moderate percentage of self-seeking, narrow-minded, thoroughly commercial persons, whose expressed views are based in reality on expectations of dollars and cents return to themselves, not on the welfare of the people. Some of them have subsisted for years on the golden products of superheated volubility interspersing a few facts charred beyond

recognition. Those in the public health group decry the medical profession and all its works thinking to make more places and salaries for themselves, climbing by pulling the other fellow down. Their most violent criticism of a physician's opinions is "He went medical." That in their estimate is the lowest depths of moral degradation. The physicians' group referred to claim that public health workers interfere with their practices; regulations make things hard for them; they steal their work; their money; lessen disease; and hurt their practices.

For these groups, who misrepresent health departments, other public health organizations, and practising physicians, and disgrace themselves, we must turn aside and do some missionary work,

educate them out of their gilt-lined rut, especially those who are destructively vocal. To physicians we can easily demonstrate that the more diligently and faithfully and unselfishly we work for others the greater the emolument—depending of course somewhat upon the chosen field for work and upon the way the word "emolument" is defined. We dare to presume that it is much the same with the comparable successes of health workers. Worth is acknowledged proportionately if not adequately. If we are not successful in our efforts at reformation, how about giving these black sheep a very icy shoulder and studied inattention on all occasions when they are "looking for something good." They do not belong in our ranks.

Prevention of Stream Pollution

IN the iron and steel industry an outstanding problem is to prevent stream pollution by waste liquors from such operations as pickling, in which metal is commonly acid-treated. This industry, after endeavoring to solve this problem for many years at heavy expense, has recently founded, through the American Iron and Steel Institute, a fellowship at Mellon Institute of Industrial Research, in Pittsburgh, with the aim of acquiring novel ideas and attempting a definite solution. This investigation will be carried on until concluded to the satisfaction of health

and industrial authorities. It will be the objective to treat or process the waste liquor of pickling plants so as to render it entirely safe for discharging into streams, recovering from it chemicals from which useful products can be made economically.

Willard W. Hodge, professor of chemical engineering and head of the Department of Chemical Engineering at West Virginia University, and also director of the Engineering Experiment Station of that institution, has been granted a year's leave of absence to head the investigational work.

Chloramine Treatment of Sea Water*

LEWIS V. CARPENTER, F.A.P.H.A., LLOYD R. SETTER, AND
MORRIS WEINBERG

*Professor of Sanitary Engineering; Instructor in Sanitary Engineering;
Research Chemist; New York University, New York, N. Y.*

CHLORAMINE treatment has been tried for sterilization of salt water swimming pools along the Atlantic seaboard to eliminate the complaints of patrons concerning the irritation of the throat and eyes by chlorine. These studies were started because of the uncertainty of the effectiveness of chlorine when using salt water with a pH of about 8.0. The following procedure was adopted as the most practical approach to the problem of swimming pool disinfection when the contamination occurs in the presence of the disinfectant.

To a series of 250 ml. clear glass stoppered bottles containing 100 ml. of sea water at laboratory temperature was added a variable quantity of ammonium chloride and a measured quantity of chlorine water. After 3 hours of ammonia and chlorine treatment, 10 ml. of each sample was removed for a residual chlorine test.

The residual sample in each bottle was then inoculated (contaminated) with exactly 2 ml. of cotton filtered raw sewage. After 2, 5, 15, and 30 minutes contact of the sewage with the treated sea water solution, 10 ml. was transferred with a sterile pipette to a sterile test tube containing a small crystal of

sodium thiosulphate. Duplicate nutrient agar (Bacto-Difco) plates were immediately prepared from decimal geometric tap water dilutions of the thiosulphate treated aliquots. Using a Lumi-lens magnifier, the bacterial colonies were counted after 24 hours' incubation at 37° C. Residual chlorine was determined by the orthotolidine method immediately prior to, and 15 minutes after, sewage inoculation.

RESULTS

The sea water used in the disinfection studies was obtained from Rockaway, N. Y., off a jetty opposite Beach 19th Street. The more pertinent chemical analyses of the sea water are as follows:

Total Solids	35,708 p.p.m.
Calcium	503 p.p.m.
Magnesium	1.185 p.p.m.
Total Iron	0.36 p.p.m.
Chlorides	17,640 p.p.m.
Kjeldahl Nitrogen	0.144 p.p.m.
Ammonia-Nitrogen	0.07 p.p.m.
Nitrite-Nitrogen	0.0002 p.p.m.
Alkalinity (as CaCO ₃)	108 p.p.m.

The pH of the sea water was found to be 7.9 electrometrically (Hellige glass electrode apparatus) and 8.0 colorimetrically (uncorrected for the salt effect). Chlorination, equivalent to 1.5 mg. per liter in the presence of zero and 3.0 mg. NH₄Cl-N per liter, had no effect on the colorimetric pH reading.

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

Of 21 series of experiments using a constant dose of chlorine and a variable concentration of ammonia, 8 are presented as representative.

The desk data were analyzed by plotting the logarithm of numbers surviving against time. In cases where less than two organisms survived per ml., it was assumed that the survival was one organism per ml. or one organism per plate. Generally a smooth curve could be drawn connecting all points. In a few instances where a single determination was an obvious error a correction was made.

The original number of organisms present at zero time in a series was obtained by extrapolation of the sea water disinfection curve (the blank). Using the above value as 100 per cent, the percentage survival of organism was tabulated.

In 4 series the chlorine dose was 1.2 p.p.m., and the residual chlorine content at the end of 3 hr. was substantially the same for samples of equal ammoniation. Arithmetic averages of comparable treatments for both residual chlorine tests and the percentage survival of organisms were made and

plotted on a semi-logarithmic scale in Figure I. The curves show the survival of organisms in percentage, for disinfection periods of from zero to 30 min.

The ammonium chloride treatment is indicated on each curve by the ratio of ammonia nitrogen added to chlorine dose. The average residual chlorine values prior to bacterial inoculation and after 15 minutes of disinfection are also indicated.

The curves show:

1. Sea water itself caused a fairly rapid death rate of sewage organisms. An average of 21.2 per cent survive after 30 min.
2. Sea water chlorination equal to 1.2 p.p.m. without ammoniation caused an increased rate of disinfection (an average of 0.35 per cent survival after 30 min. disinfection).
3. Pre-ammoniation equal to $\frac{1}{4}$ to $\frac{1}{2}$ the chlorine dose of 1.2 p.p.m. was far less efficient than chlorination alone (5.6 and 2.8 per cent) survival in 30 min. for N:Cl₂ ratio of 0.25 and 0.5 respectively. Furthermore, after 5 min. of disinfection, the death proceeded at a rate very similar to that obtained from sea water alone.
4. Pre-ammoniation equal to and twice the chlorine dose gave a disinfection rate similar to chlorination alone (0.20 and 0.55 per cent) survival after 30 min. with a N:Cl ratio of 1.0 and 2.0 respectively.
5. Pre-ammoniation to N:Cl ratios less than 1.0 apparently causes a greater consumption of chlorine than non-ammoniated sea water or ammoniation to N:Cl₂ ratios of 1.0 or greater.

In 4 series of experiments the chlorine dose was 1.4 p.p.m. in 2 series and 1.6 p.p.m. in 2 others. Slight differences in results between the higher and lower dosages were considered insignificant and the 4 series were averaged together. The curves showing the percentage survival of organisms against time of disinfection with an average chlorine dose of 1.5 p.p.m. are presented in Figure II. The curves indicate that disinfection proceeds similarly, but at a more rapid rate than with the 1.2 p.p.m. chlorine dose except for ammonia-

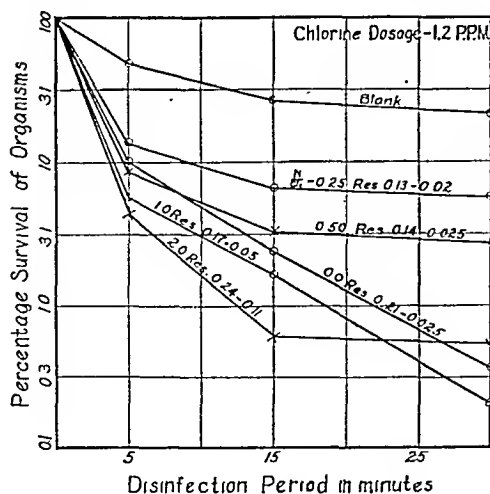


FIGURE I—The relation between the survival of organisms during disinfection with a dose of 1.2 p.p.m. Cl₂ made 3 hours prior to bacterial contamination.

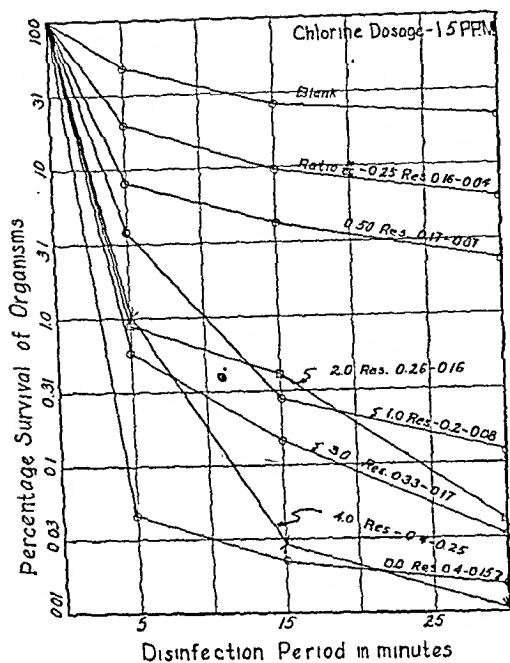


FIGURE II—The relation between the survival of organisms during disinfection with a dose of 1.5 p.p.m. Cl_2 made 3 hours prior to bacterial contamination.

chlorinated ratios less than 1.0. Chlorination alone gave a survival of less than 0.015 per cent in 30 min. Ammonia-chlorination ratios of 2, 3, 4 gave practically the same bacterial kill in 30 min. as did chlorination, although the initial rate of disinfection was less rapid.

The relation between bacterial death rate and residual chlorine can be more clearly presented in Figure III where the percentage survival of organisms in 15 min. is plotted logarithmically against the chlorine residuals in p.p.m. at the beginning and end of the 15 min. disinfection period. The right extremity of each bar represents the chlorine residual at the beginning of disinfection and the left hand extremity the chlorine residual after 15 min. A diagonal line was drawn from a point indicating the average survival in the absence of chlorination to the midpoint of the lower left hand bar in which the ammonia-nitrogen to chlorine ratio was 4.0.

This arbitrary index line shows a fairly definite trend that the 15 min. death rate of chlorine disinfection, with or without ammonia, practically doubles with each 0.1 p.p.m. increase in the mean residual chlorine during disinfection, more or less independent of the ammonia dose and that a mean residual chlorine during disinfection of 0.27 p.p.m. will give an average kill of 99.9 per cent of organisms.

The major drop in residual chlorine of ammoniated sea water with $\text{N}:\text{Cl}_2$ ratios below 1.0 over that of the chlorinated sample during the 3 hours prior to sewage inoculation was of sufficient interest to warrant further investigations. Eleven additional series of tests were made in which residual chlorine was obtained at frequent intervals over a 3 to 6 hour period. After chlorine-ammonia treatment in the absence of direct sunlight at laboratory temperature a typical series is presented in

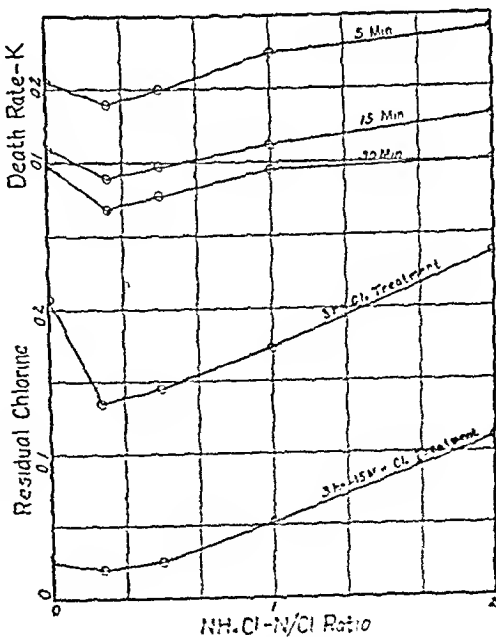


FIGURE III—Relation between bacterial death rates, residual chlorine at the beginning and after minutes of disinfection for different ammonia-nitrogen to chlorine ratios with a chlorine dose of 1.2 p.p.m.

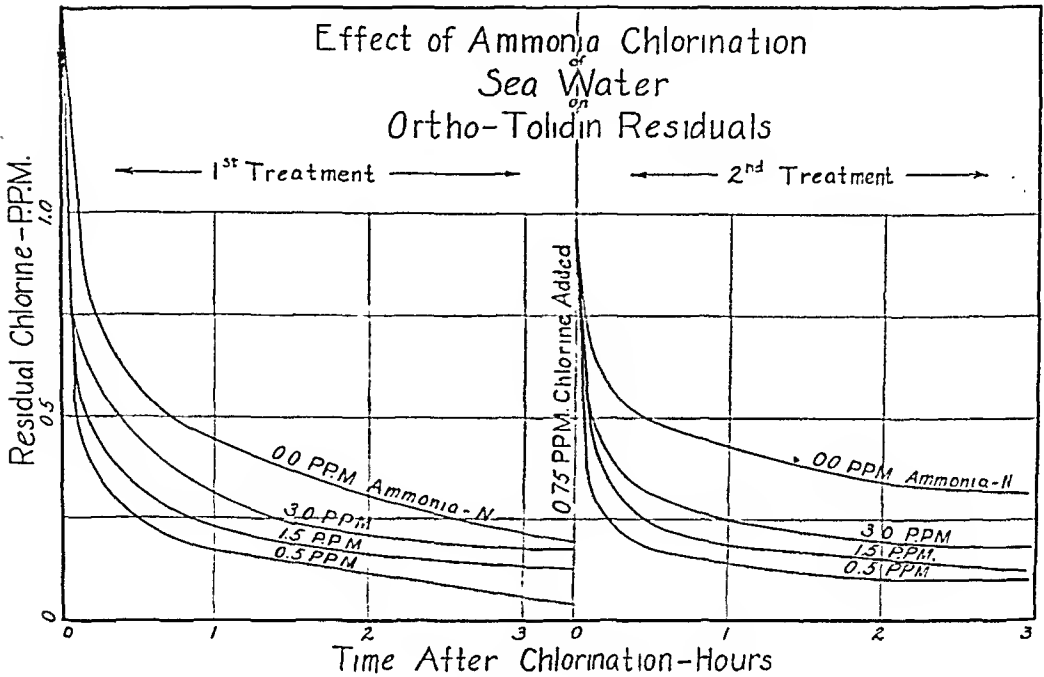


FIGURE IV—Effect of ammonia chlorination of sea water on orthotolidine residuals

Figure IV in which sea water samples containing varying quantities of nitrogen as ammonium chloride were treated with 1.5 p.p.m. chlorine water, and after a 200 min. contact period the samples received an additional dose of 0.75 p.p.m. chlorine. The residual chlorine values are plotted against the time of treatment.

A rapid reduction of residual chlorine occurred in all samples. The rate of residual chlorine reduction was least in samples containing no added ammonia and greatest in samples ammoniated to a slight degree, *i.e.*, 0.5 p.p.m., ammonia nitrogen. Two-thirds of the chlorine dose was dissipated after 5, 20, and 40 min. for nitrogen added to chlorine added ratios of 0.33, 2.0, and 0.0 respectively during the first treatment. After a low residual chlorine tension of less than 0.5 p.p.m. was reached the rate of chlorine reduction materially decreased. Rechlorination of the samples after 200 min. treatment produced results showing again a rapid dissipation

of the chlorine very similar to the first treatment.

Preliminary tests indicated an increase in the dissolved oxygen content of ammonia-chlorinated sea water. Apparently low ammonium nitrogen values in the presence of sea water chemicals results in a greater decomposition or break-down of the chlorinous compounds than ammonia-chlorination to high nitrogen to chlorine ratios or chlorination without ammoniation.

DISCUSSION

Disinfection studies of sea water by means of the chlorine-ammonia process were conducted to simulate conditions of salt water swimming pool bacterial control. It was assumed that the salt water would be recirculated and that the clarified return water would be chlorinated to maintain a residual chlorine content in the pool to disinfect sporadic bacterial contamination efficiently.

It was observed that chlorine dose

was rapidly depleted. The reduction of chlorine could not be accounted for by the "chlorine demand" of the unpolluted sea water. The rate of break-down of residual chlorine appeared almost equally rapid in the dark as in the presence of diffused daylight at laboratory temperatures.

Chlorination in the presence of an ammonia-nitrogen dose equal to less than, roughly, twice the chlorine dose resulted in a more rapid dissipation of residual chlorine than chlorination without ammonia or ammonia-chlorine treatment to ratios greater than 2.0.

The rapid break-down of chlorine in the presence of small amounts of ammonia nitrogen bears a rather important relation to practical salt water swimming pool control where the ammonia nitrogen in a recirculating system will accumulate due to hydrolysis of urea. It may be advantageous to ammoniate initially and maintain a rather high ammonia content. It is of interest to note at this point that in the disinfection studies the ratio of ammonia nitrogen present to chlorine residual *at the beginning of a disinfection period* exceeded 15 to 1 in all ammoniated samples.

The more rapid break-down or dissipation of residual chlorine in the presence of small amounts of ammonia was observed by Gerstein² on Lake Michigan water. The accentuated break-down was not so great as in sea water and the greatest effect was found at somewhat lower ammonia to chlorine ratios. The fact that an abnormal break-down of chlorine did not occur in distilled water led Gerstein to attribute the break-down to the "normal chemical constituents" in the lake water. Ammonium nitrogen in sea water results in a more pronounced dissipation of chlorine and over a wider ammonia nitrogen to chlorine ratio. It is a matter of conjecture whether small amounts of ammonia in conjunc-

tion with sea water chemical constituents cause the break-down of hypochlorites or whether the sea water constituents cause a more rapid break-down of certain chloramines.

Considerable investigation¹⁻⁵ of surface water ammonia-chlorine treatment definitely indicates the formation of chloramines having a lower disinfecting power than chlorine alone. A perusal of Figure III fails to substantiate conclusively the supposition that chlorine-ammonia compounds are formed in sea water at a pH of 7.9. The curve correlates the degree of disinfection against the average residual chlorine during the disinfection period irrespective of the amount of ammonia present. A similar observation on a number of experiments in which the average residual chlorine during the disinfection period was the same for varying ammonia treatments would be more conclusive but experimentally quite impossible. It was observed, however, that the diminution of residual chlorine during the 15 min. period after the addition of sewage inoculation was 40 to 50 per cent less for ammoniated samples than chlorination alone. This possibly indicates the formation of chlorinous compounds having a lower oxidation potential which is not shown in the disinfecting power.

SUMMARY

Sea water has considerable disinfecting properties on fresh sewage organisms. An average of 80 per cent of the organisms are killed in 30 min.

In sea water polluted with from 2,000 to 20,000 organisms per ml., chlorination or ammonia-chlorination results in an average kill of 99, 99.9, and 99.99 per cent of the organisms in 15 min. time for mean residuals during the disinfection period of 0.15, 0.27, and 0.37 p.p.m., respectively.

Preammoniation of sea water (on the nitrogen basis) equal to $\frac{1}{4}$ to $\frac{1}{2}$ a

chlorine dose of 1.2 to 1.6 p.p.m. results in the dissipation of $\frac{2}{3}$ the chlorine in 10 min. An equal dissipation of chlorine occurs in 30 and 60 min. for an ammonia-chlorine ratio of 2.0 and straight chlorination respectively.

The rate of chlorine dissipation in chlorinated and ammonia-chlorinated sea water is relatively slow after the residual chlorine has reached the 0.5 p.p.m. level.

On the basis of the data obtained, disinfection is a function of the mean residual chlorine maintained during disinfection period irrespective of ammoniation. It appears that with low chlorine doses higher mean residuals may be maintained in *polluted* sea water with the aid of ammonium compounds.

work reported in this
workers of project No.
, of the Research and
the Works Progress
New York City, and by
graduate student at New

ICES

all, N. J. Sterilizing
formaline, under Var-
d and pH. J. Am.
1935.

icidal Efficiency of
J. Am. Water

of Chlorine and
Eng. & Contract

y of the Am-
r Works Assoc.

egree of Refu-
drinking Water
Procedure and
Part I and
in Neder-
1930.

Measles in Detroit, 1935*†

I. Factors Influencing the Secondary Attack Rate Among Susceptibles at Risk

FRANKLIN H. TOP, M.D.

*Medical Epidemiologist, Detroit Department of Health and
Herman Kiefer Hospital, Detroit, Mich.*

IN spite of the ubiquity of measles, epidemiological knowledge of the disease is based upon surprisingly few published studies. Among these Panum's monumental work in the Faroe Islands,¹ has by all odds contributed most. Conditions were unparalleled for determining the incubation period, the variation in the duration of prodromes and other factors which he investigated; yet the observations were made under unusual conditions in a community where measles had been absent for 65 years and where the population was highly susceptible to the infection. Chapin's contribution² is a study of measles occurring over 66 years (1858-1923 inclusive) in Providence, R. I. English workers such as Hamer,³ Brownlee,⁴ Soper,⁵ and Stocks,⁶ have contributed a considerable literature to the theory of the epidemic cycle; Stocks and Karn⁷ studied certain phenomena noted in a series of epidemics in St. Pancras. In this country, Collins⁸ and Hedrich⁹ furnish data concerning completeness of reporting and the age distribution of cases, while Emerson¹⁰ has evaluated the effect of current administrative

practice on the incidence, fatality, and death rates of measles. The recent publications on measles from the London County Council¹¹ deal with administrative and prophylactic measures applied within its jurisdiction.

In general, much which we profess to know about measles is dependent upon clinical impression and inadequate field investigations, without benefit of statistical treatment. Measles is more communicable than most infections. The opinion is quite general that most measles contacts will develop the disease. In fact, parents often consider it unfortunate when all susceptible children in the family do not take the disease at one time, reasoning that it is more convenient to be done with it at once.

It has been stated that 90 to 95 per cent of all children have contracted measles by the time they reach the age of 15 years.^{8,9,12,13} Granting this, is it not possible that the communicability of measles may be influenced by certain conditions which have been demonstrated to influence less communicable diseases? Chapin² found that 76.2 per cent of susceptible contacts at all ages developed measles when exposed. Stocks⁶ states (he contends that in St. Pancras, reporting was only 10 to 15 per cent under the actual occurrence

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

† This study was made possible through assistance of WPA Project Number 82-4-120—A Survey of Health Conditions in Detroit.

of the disease) that for every reported case of measles there are 3 susceptible persons exposed who do not contract it. He considers them to be temporarily immune, but again susceptible by the time the next epidemic occurs 2 years later. In the light of these contentions it would seem that there is ample justification for a further study of measles as it occurs in epidemic cycles in an urban community large enough to give an adequate number of cases.

SOURCE OF MATERIAL

During 1935, 27,430 cases of measles were reported in Detroit. The cases were classified by families: (1) families in which one or more susceptible contacts received some prophylactic agent, (2) families, no member of which received a prophylactic agent. This report is based on the second class. There were too many families in this class to make follow-up visits feasible. It was therefore determined to study thoroughly a small group—approximately one-fifth of all the families. A random selection was made by taking every fifth family record from the files. From the group thus selected the following were excluded for obvious reasons:

1. Families with no susceptible contacts
2. Families with an incomplete case record
3. Families in which a change of diagnosis was made
4. Children from orphanages and boarding homes
5. Families which could not be located on subsequent follow-up visits

Beginning August, 1936, follow-up visits were made to those families of the sample group in which one or more susceptible contacts had not been reported as having developed measles, to determine the accuracy of history of previous measles and the number of cases which had not been reported.*

After eliminating all families which could not be located on this visit, there remained a group of families no member of which had received prophylaxis, who serve as a sample of the larger untreated group.

Families in this sample group which were thoroughly investigated were shown not to differ materially from the larger group when compared with respect to: (1) age of the primary case ($p = .35$), (2) age distribution of susceptible contacts ($p = .13$) and (3) the proportion of susceptible contacts in each age group reported as developing measles ($p = .72$).

FACTORS CONSIDERED IN THIS STUDY

There are many factors which might affect the secondary attack rate among exposed susceptibles. Many are related to the nature of the infectious agent, in this instance probably a filtrable virus, and are outside the scope of this investigation. Certain aspects relating to the host and his environment are considered in the following questions which might have a bearing on the secondary attack rate:

A. Does the age or sex of the primary case affect the number of secondary cases developing among susceptible contacts?

B. What influence do age and sex of the susceptible contact exert on the secondary attack rate?

C. What is the relationship of the period in the seasonal cycle to the secondary attack rate?

D. What is the relationship of the number of primary cases per family to the secondary attack rate?

E. What variation of secondary attack rates is occasioned by exposure of susceptible contacts to repeated exposure to a constant intensity and differing intensities of exposure at one time?

DEFINITIONS

Before attempting an answer to the questions proposed certain terms are defined according to their use in this study.

* A visit was deemed unnecessary to families in which all susceptible contacts were reported as having contracted measles.

TABLE I

Attack Rates Among Susceptible Contacts According to Age and Sex of Primary Case

Age of Primary Case	Sex of Primary Case	Number Contacts	Number Secondary Cases	Attack Rate
Under 1	M.	5	2	(40.0)
	F.	7	4	(57.1)
1-4	M.	104	77	74.0
	F.	140	101	72.1
5-9	M.	633	551	87.0
	F.	679	602	88.7
10-14	M.	18	14	77.8
	F.	30	20	66.7
15+	M.	12	7	58.3
	F.	5	2	(40.0)
All ages	M.	772	651	84.3
	F.	861	729	84.7
	M. & F.	1,633	1,380	84.6

Primary Case—The first case in a family presumably resulting from extra-familial exposure over 30 days after any previous case. Subsequent cases, the rash of which occurred within 6 days of the rash of the first case, were also called primary cases. Rash dates were used in determining the 6 day interval.

*One-primary Family**—A family in which one primary case occurred.

Multiple-primary Family—A family in which 2 or more primary cases occurred.

Susceptible Contact—Any child under 10 years of age reported as not having had measles previously who was exposed to a case of measles within the family. Susceptible contacts were limited to ages under 10 because children above the 6th grade were allowed to go to school and were not recorded as contacts.

Secondary Case—A case of measles developing more than 6 days after the onset of the 1st case in the family. The study included both reported secondary cases and those determined by subsequent investigation.

Exposure Period—An arbitrary period during which effective contact could have taken place. The number of days a measles case was infectious was arbitrarily placed at 8 days. This was arrived at as follows: 1 day before the prodromes plus 4 days of prodromes plus 3 days of rash.

Person-days of Exposure—The total number of days a contact was exposed. This was reckoned as follows: One person exposed to 1 case was considered as 8 person-days of exposure; 1 person exposed to 2 cases was considered as 16 person-days of exposure, whether exposure was simultaneous or in sequence.

Month—The month refers to the date of onset.

ANALYSIS AND DISCUSSION OF FACTORS

Age and Sex of Primary Case—Among 1,253 one-primary families, 1,380 secondary cases occurred with 651 attributable to male primary cases and 729 to female primary cases (Table I). The attack rate for contacts exposed to males is 84.3 and to females, 84.7.

The effect of age of the primary case on the secondary attack rate is shown in Table II. There are too few contacts under 1 and over 14 years of age to warrant consideration. Primary cases 5 to 9 years of age had the greatest number of contacts exposed of all primary age groups considered, with a total of 1,312 or 80.3 per cent of all contacts; furthermore, the contacts exposed to this age group had the highest attack rate in each contact age group.

* Unless otherwise noted, data relate to susceptible contacts in one-primary families.

TABLE II

*Attack Rates Among Susceptible Contacts According
to Age of Primary Case and Age of Contact*

Age of Primary Case	Age of Contact											
	Under 1			1-4			5-9			10-14		
	No.	No.	Attack	No.	No.	Attack	No.	No.	Attack	No.	No.	Attack
	Contacts	Cases	Rates	Contacts	Cases	Rates	Contacts	Cases	Rates	Contacts	Cases	Rates
Under 1	0	0	(—)	9	3	(33.3)	3	3	(100.0)	12	6	50.0
1-4	51	20	39.2	119	105	88.2	74	53	71.6	244	178	73.0
5-9	110	56	50.9	826	778	94.2	376	319	84.8	1,312	1,153	87.9
10-14	2	1	(50.0)	18	13	72.2	28	20	71.4	48	34	70.8
15+	2	1	(50.0)	11	6	54.5	4	2	(50.0)	17	9	52.9
All ages	165	78	47.3	983	905	92.1	485	397	81.9	1,633	1,380	84.6

The primary age group, 1 to 4, in comparison, had but 244 contacts, 14.9 per cent of the total. The attack rates for the respective primary age groups vary somewhat when considered for each age group of contacts but the differences do not appear to be highly significant ($p = .1$).

Age and Sex of the Contact—Of 1,633 susceptible contacts in one-primary families 786 were males and 847 were females (Table III). The respective attack rates were 84.4 and 84.7. Differences in attack rates between sexes are slight for each age group of contacts.

Of all contact age groups that of 1 to 4 contains 983 individuals or 60.2 per cent of the total (Table II). For each age band of primary cases, the

contact age group, 1 to 4, shows a greater number of susceptibles exposed, except for the primary case group, 10 to 14, with a higher attack rate in each instance. When all three of the contact age groups are compared, the attack rates vary considerably and are significantly different ($p = .0000$). When the contact age groups, 1 to 4, and 5 to 9, are compared, the difference is not very significant for a sample of this size. The attack rate in children under 1 year, however, is significantly lower than the attack rates in the older children.

Apparently, neither the sex of the primary case nor that of the susceptible contact influences the secondary attack rate. The age of the primary case has not been shown to influence very sig-

TABLE III

Attack Rates Among Susceptible Contacts by Age and Sex of Contact

Age of Contact	Sex of Contact	Number Contacts	Number Cases	Attack Rates
Under 1	{ M.	77	32	41.6
	{ F.	88	46	52.3
1-4	{ M.	472	441	93.4
	{ F.	511	464	90.8
5-9	{ M.	237	190	80.2
	{ F.	248	207	83.5
0-9	{ M.	786	663	84.4
	{ F.	847	717	84.7
	M. & F.	1,633	1,380	84.6

nificantly the secondary attack rate, though the 5 to 9 primary age group gave the highest secondary attack rates. A significantly lower attack rate was found among susceptible contacts under 1 year of age.

Relationship of the Period in the Seasonal Cycle to the Secondary Attack Rate—The number of susceptible contacts by month appears in Table IV.

TABLE IV

Attack Rates Among Susceptible Contacts by Age and Month

Month	Number Contacts	Number Cases	Attack Rates
January	38	33	86.8
February	136	120	88.2
March	589	511	86.8
April	620	532	85.8
May	196	156	79.6
June	45	26	57.8
July	6	...	(0.0)
August	...	...	(...)
September	3	2	(66.7)
Totals	1,633	1,380	84.6

Early in the epidemic cycle, namely, during January and February, there were fewer contacts than noted for the immediate succeeding months, but the attack rate was as high in these as during March, April, and May. The attack rate for the individual months varies but slightly although toward the

end of the epidemic cycle, in May and June, there is a relative but not highly significant decrease ($p = .15$). Such differences as exist might be explained by infection of the more highly susceptible children earlier in the epidemic year.

Relationship of the Number of Primary Cases per Family to the Secondary Attack Rate—It is conceivable that more than one primary case in a family might increase the attack rate among susceptible contacts in the family. In Table V, data are presented showing the attack rates among susceptible contacts exposed in families with 1, 2, and 3 primary cases. In one family with 5 primary cases there was 1 susceptible contact, but measles did not develop. The number of contacts exposed in three-primary families is too small to consider but they are included to give the complete picture. When the data for one- and two-primary families are examined, it will be noted that with one exception, the age group, 1 to 4, the attack rates are higher in one-primary families than in the two-primary families. The variation is so slight, however, that it is not of much consequence. The number of contacts in the

TABLE V

Attack Rates Among Susceptible Contacts According to Number of Primary Cases in the Family

Age of Contact	Number of Primary Cases in Family *								
	1			2			3		
	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates
Under 1	165	78	47.3	24	9	37.5	4	1	(25.0)
1	178	164	92.1	12	10	83.3	4	3	(75.0)
2	246	225	91.5	19	8	80.0	1	1	(100.0)
3	304	284	93.4	22	22	100.0	2	2	(100.0)
4	255	232	91.0	23	22	95.7	1	1	(100.0)
	—083	—035	—92.1	—67	—62	—92.5	—8	—7	
5	207	180	87.0	18	17	89.5	1	0	(0.0)
6	107	89	83.2	4	2	(50.0)	0	0	(...)
7	75	60	80.0	8	5	(62.5)	2	2	(100.0)
8	56	44	78.6	2	1	(50.0)	0	0	(...)
9	40	24	60.0	4	3	(75.0)	1	1	(100.0)
0-9	—485	—507	—89.1	—36	—28	—77.8	—4	—3	
	1,633	1,380	84.6	127	99	78.0	16	11	68.8

* In the 1 five-primary family there was one susceptible contact—measles did not develop.

TABLE VI

Attack Rates Among Susceptible Contacts Exposed to One-Primary Cases by Number of Exposure Periods, Person-Days of Exposure, and Age of Contact

Number Exposure Periods	Person- Days of Exposure	Age of Susceptible Contact											
		Under 1			1-4			5-9			10-14		
		Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates
1	8	125	74	60.2	937	877	93.6	457	385	84.2	1,517	1,336	88.1
2	16	32	3	9.4	35	22	62.9	21	8	38.1	88	33	37.5
3	24	0	0	(....)	1	0	(0.0)	0	0	(....)	1	0	(0.0)

two-primary families is small and larger totals might alter the result. However, it is remarkable that the attack rates for two-primary families is not notably higher than for one-primary families. It might appear unusual that exposure of susceptibles to 2 primaries should result in attack rates of the same or lower magnitude than encountered for similar age groups among one-primary families—on second thought, however, a plausible explanation appears. The attack rates for individual ages from 1 to 9 years, inclusive, vary between 60 and 93 per cent. If an attack rate of 85 per cent is taken as the mean for all ages considered, the hazard of exposure to additional primaries could possibly affect only 15 per cent of susceptible contacts. Thus, secondary attack rates in multiple primary families could not be much larger than for one-primary families. Again, it is possible that the remainder in multiple-primary families might be more resistant on account of selection—some of the subsequent primary cases being, in fact, secondary cases.

The Effect on Secondary Attack Rates Occasioned by Repeated Exposure to a Constant Intensity—A measles case was considered to be infectious for 8 days—arrived at as noted in the definition of "exposure period" given above. In Table VI, susceptible contacts are classified by age, exposure

periods, and person-days of exposure. The majority of contacts had one exposure. Very few contacts remain who were exposed for two periods, and but one contact was exposed for three periods. In the one-exposure group, the secondary attack rate for all contacts exposed is 88.1. For contacts exposed twice, a period of 16 days, the attack rate was 37.5. Evidently the few contacts who escape measles after one exposure have a decidedly smaller probability of contracting measles when exposed a second time but the additional hazard is still real. Whether part of the decreased risk at second exposure is due to sub-clinical infection with development of temporary immunity resulting from first exposure, is conjectural. It is possible, in the light of Panum's observations, that a considerable number of contacts who do not contract the disease on second exposure may have given an incorrect reply when questioned regarding an attack of measles in the past. Again, the highly susceptible may have been eliminated by the one-period exposure which would tend to make the attack rate lower in the two-period group.

The Effect on Secondary Attack Rates Occasioned by One Exposure to Various Intensities—The effect on the secondary attack rate of exposure to multiple primary cases is considered above and leads to further investigation

TABLE VII

Attack Rates Among Contacts by Number of Primary Cases, Person-Days of Exposure, and Age of Contact

		Age of Susceptible Contact											
		Under 1			1-4			5-9			10-14		
Number of Primaries	Person-Days of Exposure	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates
1	Under 8	...	..	(....)	5	3	(60.0)	3	2	(66.7)	8	5	(62.5)
	8	123	74	60.2	937	877	93.6	457	385	84.2	1,517	1,336	88.1
	16	32	3	9.4	35	22	62.9	21	8	38.1	88	33	37.5
	17+	10	1	10.0	6	3	(50.0)	4	2	(50.0)	20	6	30.0
2	Under 16	..	..	(....)	2	2	(100.0)	3	3	(100.0)	5	5	(100.0)
	16	21	9	42.9	63	58	92.1	31	25	80.6	115	92	80.0
	17+	3	..	(0.0)	2	2	(100.0)	2	..	(0.0)	7	2	(28.6)
3	24	2	1	(50.0)	8	7	(87.5)	4	3	(75.0)	14	11	78.6
	25+	2	..	(0.0)	..	..	(....)	..	..	(....)	2	..	(0.0)
5	40	..	..	(...)	..	..	(....)	1	..	(0.0)	1	..	(0.0)
Totals		193	88	45.6	1,058	974	92.1	526	428	81.4	1,777	1,490	83.8

of the possible effect of intensity of exposure (Table VII). An exposure period of less than 8 days is possible if the primary case was removed to hospital during the 8 day period. Therefore, in families in which there was 1 primary case, susceptible contacts may have been exposed for less than 8 days, for 8 days, or if exposed to additional members of the family as they developed measles, for more than 8 days. Each additional exposure to another measles case in the family was considered as an additional 8 days of exposure. Thus, a child in a one-primary family may have been exposed for 16 days—8 days to the primary case and 8 days to another member of the family. The great majority of contacts were exposed for 8 days. The few remaining contacts are principally in the 16 person-days of exposure group. Table VI is almost a duplicate of that part of Table VII which deals with contacts to one-primary cases; the differences are the result in Table VI of exclusion of contacts exposed to more than 1 additional familial case in 1 exposure period.

When two-primary families are considered, the majority of contacts were

exposed for 16 days, that is, exposed to 2 primary cases but to no subsequent secondary cases. No comment is warranted for contacts to families with 3 primaries, for their number is too small.

To determine adequately the effect of intensity of exposure in the same period of time, the attack rates resulting from exposure for an 8 day period in one-primary families, a 16 day period in two-primary families, and a 24 day period in three-primary families should be compared (Table VIII). In other words, a comparison is being made between contacts in one-primary, two-primary, and three-primary families who were not subsequently exposed to a secondary case. The attack rate for contacts exposed in a family with 1 primary case is 88.1, for those exposed to 2 primary cases 80.0, and for 14 contacts exposed to 3 primary cases, 78.6. There is little difference between the secondary attack rates. A variation in intensity of exposure as measured by the number of cases in the family to which a susceptible is exposed during the same period of exposure (8 days), therefore, appears to exert no significant effect upon the secondary attack rate.

TABLE VIII

Attack Rates Among Susceptible Contacts Exposed to One-, Two-, and Three-Primary Cases During One Exposure Period

Number of Primaries	Person-Days of Exposure	Age of Susceptible Contact											
		Under 1			1-4			5-9			10-14		
		Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates	Number Contacts	Number Cases	Attack Rates
1	8	123	74	60.2	937	877	93.6	457	385	84.2	1,517	1,336	88.1
2	16	21	9	42.9	63	58	92.1	31	25	80.6	115	92	80.0
3	24	2	1	(50.0)	8	7	(87.5)	4	3	(75.0)	14	11	78.6
5	40	..	..	(....)	..	..	(....)	1	..	(0.0)	1	..	(0.0)

Similar considerations apply here as with Tables V and VI. It may be that on account of error in the dates given or for other reasons, some of the cases called primary were really secondary so that the multiple-primary contacts represent in part those from whom the most susceptible had been selected out by the first primary exposure. In addition, it might be that some multiple-primary families represent instances in which the entire number of contacts in the family were exposed at once, in which case the remaining susceptible contacts represent a selected, less infectable group.

Of the two factors, number of times exposed, and intensity of exposure, the former is of importance and from a practical point of view. There is a greater hazard to exposure to 2 cases separated by an 8 day interval. The bearing this has on the possible use of prophylactic agents or upon removal from the family of susceptible contacts 3 years and under is obvious.

SUMMARY

An analysis of certain factors which might affect the secondary attack rate in a random sample of families, no member of which received prophylactic therapy, in the 1935 measles epidemic in Detroit, resulted in the following conclusions:

1. The sex of the primary case or that of the susceptible contact is unimportant.

2. Age of the primary case may exert an influence on the secondary attack rate. Further investigation of this factor would appear desirable.

3. The age of the susceptible contact influences the secondary attack rate significantly.

4. Secondary attack rates are not greatly affected by the period in the seasonal cycle in which measles first appears in the family.

5. The number of primary cases per family does not affect the secondary attack rate among susceptibles in the family.

6. There is an additional hazard when a contact is exposed to measles a second time.

7. Intensity of exposure as measured by the number of cases in the family at one time does not appear to influence appreciably the secondary attack rate among susceptibles at risk.

NOTE: The author gratefully acknowledges the assistance of George F. Badger in the preparation of this paper.

REFERENCES

1. Panum, P. L. Beobachtungen über das Masern-contagium. *Virchows Arch. f. path. Anat.*, 1:492-512, 1847. (Translation by: Gafale, W. M., Peter Ludwig Panum's "Observations on the Contagium of Measles." *Isis*, 67, XXIV, 1:90-101 (Dec.), 1935.
2. Chapin, C. V. Measles in Providence, R. I., 1858-1923. *Am. J. Hyg.*, 5:635, 1925.
3. Hamer, W. H. Epidemic Disease in England. *Lancet*, Mar. 17, 1906, p. 734.
4. Brownlee, J. Certain Considerations on the Causation and Course of Epidemics. *Proc. Roy. Soc. Med.*, Section on Epid., May 1, 1909, p. 243.
5. Soper, H. E. Interpretation of Periodicity in Disease Prevalence. *J. Roy. Stat. Soc.* 92, 1929, Part I, pp. 34-73.
6. Stocks, P. The Mechanism of a Measles Epidemic. *Lancet*, 1:796-802 (Apr. 12), 1930.
7. Stocks, P., and Karn, M. A Study of the Epidemiology of Measles. *Ann. Eugenics*, 3:361-393 (Oct.), 1928.
8. Collins, S. D. Past Incidence of Certain Com-

municable Diseases among Children. *Pub. Health Rep.*, 36, No. 26, 1924.

Ibid. Age Incidence of the Common Communicable Diseases of Children. *Pub. Health Rep.*, 44, No. 14, 1929.

9. Hedrich, A. W. The Corrected Average Attack Rate from Measles among City Children. *Am. J. Hyg.*, XI:576-600 (May), 1930.

Ibid. Monthly Estimates of the Child Population "Susceptible" to Measles, 1900-1931, Baltimore, Md. *Am. J. Hyg.*, XVII:613-636 (May), 1933.

10. Emerson, H. Measles and Whooping Cough. Incidence, Fatality and Death Rates in Thirty-two

Cities in the United States, in Relation to Administrative Procedures Intended for Their Control—1924-1933. Supplement to *A.J.P.H.*, 27, 6 (June), 1937.

11. London County Council. Measles. *Report of the Medical Officer of Health and School Medical Officer on the Measles Epidemic, 1931-1932 and 1933-1934.*

12. Butler, W. Measles. *Proc. Roy. Soc. Med.* 6. Section on Epid., 1913, p. 122.

13. Henderson, E. C. A Census of the Contagious Diseases of 8,786 School Children. *A.J.P.H.*, 6:971, 1916.

Syphilis Meeting

ASSEMBLY of Laboratory Directors and Serologists, Hot Springs National Park, Arkansas, October 21-22, 1938—A meeting under the auspices of the Committee on Evaluation of Serodiagnostic Tests for Syphilis, of the U. S. Public Health Service, with Surgeon General Thomas Parran, Chairman, is scheduled for October 21 and 22, 1938, at Hot Springs National Park, Ark.

The aims and purposes of the assembly will be to consider means and methods to improve and to make more generally available the serologic tests, which are so important in syphilis control work. Tentative arrangements call for the presentation of the program in four sections.

The first section will consider the need for adherence to conventional technic in the routine performance of reliable serodiagnostic tests. Need for training of laboratory personnel will be the subject of the second section.

The third section will discuss the prosecution of the studies to evaluate the performance of serologic tests within the states. The fourth section will consider the desirability of licensing or approving, for the performance of serodiagnostic tests for syphilis, laboratories within the states by the respective state departments of health.

A separate committee will draft recommendations for each of the four sections for presentation to the assembly. The respective chairmen of these 4 section meetings will be Drs. Walter M. Simpson, Dayton, Ohio, Arthur H. Sanford, Rochester, Minn., F. E. Seneary, Chicago, Ill., and H. H. Hazen, Washington, D. C.

Out of the meeting should come a crystallization of opinion with regard to the important problems which will be considered. Those interested in obtaining further information should write to the Surgeon General, U. S. Public Health Service, Washington, D. C.

Nutritional Education in the Home

Dutchess County (N. Y.) Project*

BERTRAND E. ROBERTS, M.D.

District State Health Officer, Poughkeepsie, N. Y.

AN immense mass of evidence of the necessity for effective education of the public in the field of nutrition has accumulated in recent years. This was presented by the President of this Association at its last Annual Meeting as one of several outstanding health needs of the nation.

Decision as to the best methods of administrative approach to the problem offers many difficulties. Research has indicated that the formerly highly vaunted method of attempting to discover by physical examination those who are in need of nutritional education is of limited value, as there is no practicable procedure available for detecting in this manner much more than cases of gross malnutrition. Such cases are comparatively uncommon in most parts of this country.

On the other hand, the optimum diet recommended by authorities in the field of nutrition is far from being realized among a considerable part of the population. It is no doubt true that such a diet has been approximated among the better informed. The increased physical development noted among students entering college, as compared with that of the previous generation, is

probably a reflection of the great spread of knowledge in this field during the present century.

One principle of economics which has somehow stuck in my mind since college days is "the law of diminishing returns." This law seems already to have begun to operate in certain branches of the public health field. For instance, diphtheria has been practically eliminated in areas where effective measures have been taken to immunize the younger children, but a much greater effort proportionately is required to bring the percentage of immunizations to the vicinity of 100, while the returns, namely the reduction of diphtheria morbidity, are practically nil above, say, the 50 per cent point.

Similarly the question may well be raised as to whether the same law is not operating already in the field of nutritional education. Are health authorities justified in further large expenditures for group demonstrations and newspaper publicity for this purpose? Have not the large bulk of those who intelligently read the papers, attend group meetings, and the like, already been well instructed as to a proper diet? Is it not to be expected that the further expansion of activities along these lines will very soon reach a point where comparatively small returns, in the form of better nutrition, will result?

* Read at a Joint Session of the Child Hygiene, Food and Nutrition, and Public Health Nursing Sections of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

Whatever may be the answer to these provocative questions, few, I think, will disagree with the proposition that the greatest lack in nutrition is found among the underprivileged groups of the population, and, further, that these groups respond poorly to educational measures along the lines mentioned. In order to reach this group effectively, individual instruction of the mother in the home must be brought about. The public health nurse is logically the agent who should be depended upon for this work. She is the one who has already attained a standing among such mothers in matters relating to health. She knows appropriate methods of approach to secure action. She is already today's real health educator in the homes of the very people who most need better nutrition.

For the nurse to do effective work in this field, she must not only be instructed in the principles of nutrition, but she also needs a plan of operation under which she can gauge the lacks in the dietaries of the families with whom she works and take measures toward their correction.

This does not mean that she must be a full-fledged nutritionist. Really, all she needs to know about diet is what every intelligent mother can be expected to learn, with some additional information as to methods of dealing with the food customs of the various nationalities represented in the nurse's district. It is therefore desirable that the nurse be instructed in the basic principles of nutrition by one who is competent in this field, and that she may obtain advice from time to time on special problems that may arise in the course of her work.

A project in nutritional education has been in operation under the writer's direction in Dutchess County, N. Y., beginning in December, 1933, when the services of about 40 work relief nurses were obtained from the Civil Works

Administration. The project was further extended, though only in February and March, 1934, by the employment, through the CWA, of a nutritionist, Mary K. Swint, and 29 women workers whom she instructed and supervised. Only one of this group was a nurse.

The nurses in the other group engaged in this project have varied in number, and have been employed under various governmental auspices (TERA, CWA, WPA) as a part of a state-wide nursing project, under which bedside nursing was provided to patients on relief or in poor circumstances, and assistance was given in other public health nursing activities. The Dutchess County nutrition project was carried on by the nurses when their full time was not required for these activities.

Valuable voluntary assistance was rendered in the instruction of the nurses by Grace Thompson, chief dietician of Vassar Brothers Hospital, and by Ruth Wheeler, Ph.D., Professor of Physiology, Vassar College. The textbook *Food in Health and Disease*, by Catherine Mitchell Thoma was used by Miss Swint as a basis for an intensive course of instruction, lasting about a week. The workers were also taught economical ways of purchasing food, and were given some idea of proper methods of psychological approach in home visiting.

Each worker was supplied with literature on nutrition which was given out in families where it was felt that it would be profitably used. The workers were also instructed to provide the housewife with sufficient explanation in connection with each piece of literature.

In addition to general instructions as to nutritional requirements the housewives were given individual demonstrations in food preparation where it was felt necessary. For instance, they were shown how to use salmon in the form of a loaf or salad. Frequently a problem was found as to the proper use of

milk, especially in those families receiving public relief, where a supply of evaporated milk was often furnished but the housewives had insufficient knowledge in its proper use. Another form of demonstration was that of desirable methods of vegetable preparation, which are very commonly not understood. Sometimes it was, of course, necessary to make return visits in order to see that the instructions were effective.

The workers were able to be of some assistance to families on relief who complained of difficulties with their grocery orders. The worker would discuss the orders with the housewife and, if the latter so desired, would accompany her to the grocery and help her in choosing her supplies. In some instances the worker made out sample menus for the week with housewives, especially if they complained that insufficient food was received from the welfare agency. By this method it was often possible to demonstrate that with a little planning the weekly grocery order would provide sufficient food for the family.

Investigation forms, prepared with the assistance of Professor Wheeler, were used by all the workers, who were furnished with detailed stencilled instructions as to the method of filling them out. Each form provides spaces for recording the estimated weekly use of various kinds of foods during a year previous to the first visit and during a year subsequently, together with data regarding the composition of the household, family income, etc.

These forms for summarizing the use of foods are believed to have been of distinct advantage. Without some such form it is hardly possible to get an adequate idea of the nutritional habits of the family. They also probably aid to some extent in impressing upon the mothers' minds the importance of the work. After the form has been filled

out it serves as a talking point on which to base suggestions for dietary changes. On the other hand, I hold no brief for the specific form used. A considerable part of it was prepared for special purposes which would not apply to usual routine work. Forms of the future will no doubt be much simpler.

The data as yet have been analyzed only from the standpoint of increases or decreases in the use of milk, cod liver oil, foods rich in iron, and fruits or vegetables (exclusive of potatoes), as related to place of residence, increase or decrease in income, number of children and relief status. A quantitative estimate of the sufficiency of the dietary has not been made, both because time and personnel were insufficient, and because it is doubtful that the recollection of the housewife was accurate enough for this method to be of great significance, except possibly for such items as milk and cod liver oil. (See Note.)

NOTE: For those who are interested in the technical aspects of the subject, it is desirable to record the methods of procedure by which changes in the nutritional status of households were determined for the purposes of this study.

Various previous studies have indicated that the principal factors in which the American dietary is deficient are calcium, vitamins C and D, the latter vitamin especially among young children, and iron. (Pellagra is practically non-existent in New York State, as in most sections of the country, hence consideration of dietary improvement to combat this disease was not necessary in this project.)

The chief objective in the project therefore was improvement of the dietaries in these respects. Likewise the analysis of the record forms was made on the same basis, an estimate being made of increases or decreases in foods rich in these factors; this estimate was made in each instance under four categories: M (milk and cheese—for calcium); C (cod liver oil—for vitamin D); F (foods rich in iron); V (fruits and vegetables, exclusive of potatoes, for vitamin C).

As some items of food in each of the fore-

Nearly all the families covered in this project were on relief during some or all of the 2 year period, or received very small incomes. For 423 families the data were sufficiently complete for analysis—272 in the city of Poughkeepsie, 34 in the city of Beacon, and 117 in the rest of the county, the latter being largely in the villages and hamlets, as the workers were unable to cover remote rural sections because of lack of facilities for transportation. The analysis indicated that the dietary was improved during the year following instruction in 68 per cent of the households; it was found to be approximately

the same in 15 per cent, and impaired in 17 per cent, the impairment, as might be expected, being most marked among families with decreased incomes. It is of interest, however, that even among the 93 families whose incomes declined in the second year, the analysis indicated that the selection of foods improved in 53 per cent. Among those in which the income was increased (205 families), and in which it was approximately the same (125 families), the comparable figures were 71 per cent and 75 per cent, respectively. The cost of living was somewhat higher the second year, so that families with

NOTE (continued)

going categories except C might show an increase while others showed a decrease, a system of approximate equivalents was devised for estimating the relative values of the changes, based, in each category, on the approximate content of the food items in the special food factor for which the category was established. The following equivalents were used:

Category M

1 qt. fresh milk; 1 large can evaporated milk, $\frac{1}{4}$ lb. cheese (except cream cheese).

Category F

1 lb. beef; $\frac{1}{4}$ lb. liver; $\frac{1}{3}$ lb. dried beans; 1 can baked beans; 1 lb. mutton; 1 lb. pork (except bacon and salt pork); 3 lb. bacon; 1 lb. spinach (greens); 1 lb. dried prunes; 1 lb. ham.

Category V

1 lb. or $\frac{1}{3}$ head cabbage; 1 lb. or 2 heads lettuce; 1 lb. greens; 1 lb. (or can) tomatoes; 1 lb. or 3 oranges; 2 lb. or 6 apples; 2 lb. (or bunches) carrots; 2 lb. (or bunches) beets; 1 can tomato juice; 2 cans pineapple juice; $1\frac{1}{2}$ cans grapefruit juice; $1\frac{1}{2}$ lb. grapefruit; 2 lb. (or cans) other fruits and vegetables (except potatoes).

A clerical worker was instructed in the use of these equivalents until it was found that she was proficient in determining as to whether there was an increase or decrease in each of the categories under consideration and in marking the forms accordingly, e.g.: " $M \div F \div C \div V \div$." Changes of less than 10 per cent were considered as indicating no increase or decrease, in view of the fact that

the estimates were subject to a margin of error, even though averaging several food items tended to narrow the margin. It is recognized that the approximations are especially wide in reference to fruit and vegetables, as adequate quantitative tables on the vitamin C content of foods are not yet considered to be available. On the other hand, all forms not found by the clerical assistant to show increases or decreases in all four categories, were appraised by the writer. It is of interest that this appraisal seldom indicated a need of altering the clerical assistant's estimate as to the change in the nutritional status of the household. In general, under the system of estimates outlined above, the nutrition status was considered to be improved or impaired, if increase or decrease, respectively, was indicated in three or four of the categories, or in one or two of the categories when no increase or decrease was indicated in the remaining ones. Occasionally the change in nutrition status was otherwise classified, for example, the status was held to be improved in households where there was a large increase in milk consumption together with small estimated decreases in the use of fruits and vegetables and of foods rich in iron.

It is believed that a similar system could be inaugurated by many health agencies without the necessity of any great increase in personnel. In educational field work of this character it is of course impossible to obtain anything like the exactness in estimating results which can be maintained in laboratory work.

The writer will be glad to furnish copies of the record forms and the instructions as to their use upon receipt of a written request.

income unchanged throughout the 2 years to all intents and purposes suffered a reduced income.

Higher percentages in improvement were found among households in which there were children, than among childless households—70 per cent in those with 1 to 3 children, and 65 per cent in those with 4 or more children, as compared with 60 per cent among the childless. As there were only 29 households without children, however, this observed difference, while of interest, is hardly of statistical significance.

The recorded improvement varied considerably according to locality, the cities faring better than the smaller places; the percentages with improvement being 73 per cent in Poughkeepsie, 65 per cent in Beacon, and 57 per cent in the rest of the county. These differences may be due, to some extent, to variation in the inherent characteristics of the respective populations, but probably also reflect the fact that the nurses in the cities could find more time to devote to the work than those in other places. Also, in the city of Poughkeepsie the nurses worked under somewhat closer supervision.

Some of the more cynical among my hearers may wonder why no investigation was made of a control group, namely, families in which such educational work had not been carried on. To such questioners it is well to confess that the possibility was considered, but it was not put into effect because, in the first place, the selection of a control group is subject to more than usual difficulties in work of this sort, and in the second place, it would probably be impossible to select a suitable group whose members would not also be influenced by the educational work done among the other group, though at second-hand, that is, as the result of social intercourse between the two groups.

Neither was it deemed feasible, nor even desirable, that an attempt should be made by physical examinations and clinical tests to discover whether a reported improvement in diet was accompanied by a corresponding improvement in physical condition. Such examinations and clinical tests are not yet simple and inexpensive enough, nor conclusive enough, to be recommended for large-scale work. Suffice it to say that what the human race needs is an adequate, well balanced diet, and that whatever is instrumental toward this end has its own justification. It is not necessary to strive for perfection, for the perfect diet is not yet known, nor is the perfect physical examination.

Nearly all of the nurses, as well as the lay women, employed in this work, had had no previous experience in the public health field. It is of course possible, and even likely, that fully trained and experienced public health nurses could have obtained a higher percentage of improvement. On the other hand, I can recall no instance in which trained public health nurses in any comparable area have been able within a single year to persuade nearly such a high proportion of mothers to adopt an even simpler procedure, namely the immunization of their preschool children against diphtheria. It must be remembered that dietary improvement involves changing the habits and tastes of a lifetime and altering customs handed down from generation to generation.

The method outlined does not involve the necessity of creating a large body of additional workers, as it can be readily integrated with the usual program of generalized public health nursing. All that is needed is a reasonable amount of basic knowledge in nutrition, which many of the nurses have already, and an additional record form for their family folders, which many will no doubt welcome!

Indiana's Dental Health Program*

HOWARD B. METTEL, M.D., AND MARY H. WESTFALL, D.D.S.

Chief; and Dental Health Educator; Bureau of Maternal and Child Health, Indiana State Board of Health

IN the organization of the Bureau of Maternal and Child Health program of the Indiana State Board of Health, dentistry has been given its rightful place. It must be understood that the program in no way can be considered as an entering wedge into state dentistry. The dental program in Indiana is a means of educating the people to the needs for dental attention, and caring for the dental needs of children whose parents are unable to provide the dental care necessary to the health of their children.

This dental health program has been made possible through funds made available to the Bureau of Maternal and Child Health by the Children's Bureau of the U. S. Department of Labor, which have been used in carrying out both the educational and demonstration services.

The Indiana State Dental Association is composed largely of dentists who see much farther than the mere mechanics of dentistry: who are aware of the great need for dental education, as well as for dental care for the children of Indiana; and who know that if we desire a better health record for the state, for children and adults as well, inspection and care must be given

to the oral cavities of children and adults.

The preliminary plans for Indiana's dental program were first formulated by the State Health Commissioner, the Director of the Bureau of Maternal and Child Health, and the Advisory Committee of the Indiana State Dental Association. Through this coöperation, and with the technical advice of the late Colonel C. T. Messner, Senior Dental Surgeon of the U. S. Public Health Service, a plan was outlined and submitted to the Trustees of the Indiana State Dental Association in May, 1936. This met with the enthusiastic and unanimous approval of the Trustees of the Dental Association.

The dental health program as inaugurated in Indiana consists of three branches: Organization, Demonstration, and Education.

ORGANIZATION

Believing that the most effective end-results of health work are gained when all health agencies coöperate and follow the same road, a concentrated effort has been put forth to secure the coöperation of the dental societies, county medical societies, and lay organizations interested in public health such as Parent-Teacher Association, the tuberculosis association, the American Red Cross, the American Legion, the service clubs, and other groups. Close coöperation with the Bureau of Public Health Nurs-

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

ing of the State Board of Health has been maintained. The part of the trained county public health nurse is important in any dental program. The nurse is of greatest assistance in making the initial contact in her work in the public schools, and can be depended upon to find those patients needing dental care, and to send the patients first to a private dentist or the dental unit.

In order to administer the plan, a technical staff was appointed, which consists of a dental health educator, a dental operator to work in the mobile unit, and a technical adviser.

DEMONSTRATION

The demonstration branch consists of a mobile dental unit—a complete dental office on wheels. Demonstration work according to the interpretation of the U. S. Children's Bureau, and the Indiana Plan, means actual work performed on patients. The mobile dental unit has all the physical adjuncts necessary to render efficient dental services. It contains a dental chair, and instrument cabinets with instruments of the latest design, an adequate laboratory, supply and linen cabinets, a sterilizer, and modern lighting equipment. This mobile unit was patterned after the one used in the Indian Reservations and the Coast Guard Service of the U. S. Public Health Service. A dental operator has been placed in charge of the work in the unit, and he does not use an assistant.

In order to select the initial demonstration area in which to locate the dental unit, the statistics of the various counties were studied to assist in determining not only the field which would be presented for demonstration, but also the financial conditions of the citizens. At this time a careful study was made of the reports of the Indiana Bureau of Vital Statistics, the Indiana State

Planning Board, and the report of the Dental Survey of School Children, U. S. Public Health Service *Publication No. 226*, from which it was found that in Greene and Owen Counties, during the years 1926 to 1933, inclusive, 6,458 children had been born. Considering the deaths and removals occurring during this time, it was approximated that there were 6,000 children in these two counties between the ages of 3 and 10 years. Therefore, in order to limit the program so as to make a proper demonstration, only those children between 3 and 10 years of age, of indigent parents, were eligible for service.

The next point was to study the financial income of those people, which would be such as to render them unable to pay for private dental service for their children. Here again the information was utilized in selecting Greene and Owen Counties as the first demonstration area. Such statistics as the agricultural income per square mile, manufactured products per capita, total assessed property per capita; percentage of population on relief rolls; and the number gainfully occupied persons receiving an income of less than \$1,000 per annum were used.

The next problem was to secure the coöperation and support of the local dentists of the proposed demonstration area. It was learned that the dentists of the selected area had an outstanding record in that every dentist practising in that area was a member of the local component society, the Indiana State Dental Association, and the American Dental Association. With this type of active organized dentists, the plan, as well as the approval of the plan by the Indiana State Dental Association in May, 1936, was placed before them for their approval. Complete support and coöperation have continued since the establishment of the demonstration service.

With the completion of the preliminary organization plans and the purchase of equipment, the unit was put into operation. According to the plan as adopted by the Advisory Committee of the Indiana State Dental Association, patients eligible to receive the benefits of dental care in the unit are those children between the ages of 3 and 10 years, whose parents are financially unable to provide for the dental care necessary. The services consist of amalgam and cement restorations, prophylaxis, and extractions.

The dental plan in Indiana establishes 3 sources from which assignment of patients to the unit can be made. A patient may be admitted to the unit for treatment upon the recommendation of the county public health nurse, since the unit will not be assigned to any county not having such a nurse, and, inasmuch as it is felt that no person is better acquainted with the people of the county and the manner in which they live than the county health nurse. Second, the local relief agency present in every county and township is permitted to refer any patients who are carried on their relief rolls. The local dentist, over his own signature, is permitted to send patients to this clinic. Thus, through these agencies, careful check is kept on patients in order that there may be no patients admitted who are not entitled to the free services.

Recommendation by the referring agencies does not mean that the patient can be taken into the clinic without further formality. Before any work can be performed on the child, the parent or guardian is requested to sign a written request for such service. It is understood that it is not a permit to work on the child, but a request from the patient that the work be done. After all of these preliminary procedures have been completed, the patient is accepted for actual dental work.

EDUCATIONAL WORK

This part of the program is under the supervision of Dr. Mary H. Westfall, the Dental Health Educator of the Bureau of Maternal and Child Health. One of the most far reaching educational devices used is the distribution of free literature to persons requesting it. The bureau to date has not prepared any literature, but, believing that the various pamphlets published by the American Dental Association adequately present the public health problems, has purchased pamphlets from them for distribution. Three publications are obtained from the Good Teeth Council for Children, Inc., Chicago.

The mobile dental unit is considered as part educational in its functions. Before the unit is sent into a community, the people are instructed in dental health matters by means of speakers before Parent-Teacher Associations, at service club meetings, etc. When the oral examinations are made in the schools in an effort to locate indigent children needing dental care, the children, of course, relay the information to their parents, and in the end the entire community becomes dental health minded. There is no point in attempting to teach any phase of public health education through the children only; this information must be presented to the parents if best results are to be obtained.

In coöperation with the Good Teeth Council for Children, Inc., we have conducted various visual educational projects in the schools in the form of puppet shows, magic shows, and nature study programs. During the past school year these programs reached 70,000 school children in the public and parochial schools and were most effective. Another form of dental education was the distribution weekly of mimic broadcast sheets to the school teachers. These stories are in the form of travel-

ogues; are printed copies of actual radio broadcasts by George Wood Clapp, D.D.S., of New York, over some eastern stations; and they can easily be integrated with projects in health, physical education, English, composition, reading, spelling, history, art, etc. The material is particularly suitable for grades 5 to 9, inclusive. There is no expense to the schools for this material, being furnished through the courtesy of the Bureau of Maternal and Child Health, the Indiana State Dental Association, and Dr. Clapp. These broadcasts are approved by the American Dental Association—the highest authority in the dental profession. This year a state-wide dental poster contest is being conducted in the public schools of Indiana, sponsored by the Indiana State Board of Health and the Indiana State Dental Association.

Being convinced that the rôle of the county public health nurse is of utmost importance in any type of health program for the public, Indiana last year conducted the first of a series of concentrated dental nursing courses. The courses were conducted at Indiana University School of Dentistry. In all, 60 nurses attended the two courses offered, and many favorable comments were made by them to the effect that they were greatly helped in making general oral health examinations of the school children. The importance of diet and nutrition was also stressed in these courses. During the coming year we plan to repeat these courses, having perhaps three courses during the school year.

In order that teachers in the public schools may be more competent in disseminating the proper dental health information to the children, during the months of July and August the Bureau of Maternal and Child Health, coöperating with the Speakers' Bureau of the Indiana State Dental Association, and the State Department of Public

Instruction, conducted a series of dental health lectures in 4 different teachers' training colleges in the state. These courses likewise met with the enthusiastic approval of the school authorities, with requests being made that similar courses be offered next year.

SUMMARY

The organization and administration and educational programs of the Indiana dental program as carried out by the Indiana State Board of Health has been presented. It is planned to proceed with this program slowly, and to improve it with each year's experience. To date the mobile dental unit has located in only the original demonstration area, namely, Owen and Greene Counties. The people in this section are in dire financial circumstances and there is much work to be done there. In most cases the toothbrushes provided the children coming to the dental unit, are the first ones which they have ever had.

The Indiana State Board of Health believes in education and more education; in teaching the parents that poor health is a handicap in any life's work; and that prevention is easier and often shorter—and certainly much cheaper—than cure. Another aim is to teach the children that teeth are vital parts of the body and should be so considered and cared for.

In considering this program, one has visions of placing more dental units in the state in caring for those children whom we have and always will have—those who cannot care for themselves. It has been interesting to note the satisfactory coöperation from the dentists, the schools, and the public at large throughout the state. The dentists inform us that, without doubt, in those communities in which the dental unit has been located the general public has become more "dental health minded," that more children who can pay for

dental care are going to their private dentists for this care.

It is the aim of the State Board of Health to develop this demonstration so that in the future perhaps one county or several counties grouping together can appropriate local funds for furnishing original equipment which may carry forth a program of their own, patterned after the one which has been demonstrated by the State Health Department. This is in the future, and per-

haps it is a long way off. It is certain that Indiana's dental program will be carried along in close coöperation with the American Dental Association, the Indiana State Dental Association and its component societies. The Indiana State Board of Health feels that these are the men who know best the needs and defects of their own communities, and should be the persons to advise us in carrying forth the future dental health program.

Plumbing in Low Cost Housing^{*}

JOEL I. CONNOLLY, F.A.P.H.A.

*Chief, Bureau of Public Health Engineering, Board of Health,
Chicago, Ill.*

IN view of the fact that drinking water which has been contaminated through faulty plumbing may spread disease, it is a public responsibility to assure that plumbing in all buildings is safe. It is just as important in low-cost housing as in any other, especially in view of the economic status of the occupants, and their sometimes inadequate nutrition, and lower resistance to disease.

Even in dwellings of the lowest cost, it is necessary to have adequate facilities for safe drinking water, cleanliness, and for removal of human excreta. It is believed that there is general agreement on a minimum for each family unit, of a kitchen sink and a bathroom containing one water-closet, one bathtub, and one lavatory. The bathroom should be accessible without going through a bedroom.

The fixtures should meet a few simple requirements. They should be provided with a safe supply of water. They should be proof against siphonage of fixture contents into the water supply system. They should be connected to a sewer leading to some adequate means of sewage disposal. They should be impervious and easily cleaned. Except the toilet bowl, all the fixtures should be supplied with hot and cold water through a mixing faucet for controlling the temperature. They should be prop-

erly trapped and vented. Pipes should not be larger or more costly than necessary, either in first cost or maintenance. The water should be from a safe, preferably public, supply. No auxiliary water supply should come into the building.

How is siphonage of fixture contents to be avoided? By removing the chief cause, which is the presence of submerged inlets to fixtures.

For example, a bathtub may be filled to a level where the inlet is submerged beneath the water surface. Then, if a sufficient decrease in pressure occurs in the water supply pipes, as may easily happen from a number of causes, the tub may function like an elevated storage tank and supply water to fixtures at lower elevations.

The ordinary flush tank for a water-closet is a fixture where the inlet is nearly always submerged, because the hush tube on the ball cock usually extends almost to the bottom of the tank.

A water-closet equipped with a flush valve is another example of a submerged inlet fixture.

If the inlet to every fixture is brought well above the rim, siphonage will not occur. Suggested minimum distances for the inlet above the rim are 1" for lavatories, 1½" for sinks, and 2" for tubs.¹

Where a fixture is covered, such as a flush tank, it is customary to place the inlet below the rim. Progressive plumb-

^{*} Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

ing manufacturers make open fixtures almost entirely with over-rim supplies. They should now give careful study to the development of a satisfactory flush tank from which siphonage cannot take place.

Suggestions for improvement are (a) to eliminate the submerged hush tube and devise some other method of quieting the entrance of the water, (b) to place the water pipe, fittings and valve entirely above the highest possible level of the water surface in the tank, (c) to increase the effectiveness of the overflow pipe, (d) to provide means for maintaining atmospheric pressure above the water surface, without drawing air through the water-closet, in case a vacuum in the water pipe withdraws the air, and (e) to elevate the bottom of all tanks above the rim of the toilet. In some instances, certain of these improvements have already been made.

A tank constructed along these lines is to be preferred over one which has no protection against siphonage or one which depends upon some mechanical device of questionable reliability to prevent the return of water from tank to pipe. On new construction, nothing less than a definite air gap between water inlet and fixture rim should be approved by those who are charged with the responsibility of construction, whether for low cost housing or any other type of building.

In the correction of existing submerged inlets, one is often confronted by the additional expense of rebuilding or redecorating defaced walls, to secure an air gap. This usually greatly increases the difficulty of securing the changes. To avoid such extra expenses, various methods have been devised. For example, a "goose-neck" pipe may be attached to the submerged inlet of a built-in tub, thus raising it above rim. As long as no leaks develop in the portion of the pipe below the rim, this is satisfactory.

Mechanical vacuum breakers are widely advertised for protection of flush valves on toilets. Obviously, a mechanical device which is subject to deterioration, liming up, sticking of moving parts, noise, maladjustment, corrosion, leakage, or variation in manufacture is vulnerable to criticism. On the other hand, in existing buildings it may be possible to secure a considerable degree of protection by permitting, without definitely approving, the installation by competent plumbers working under careful inspection, of a combination of a non-return stop and a suitable vacuum breaker, where undue delay or even complete failure to achieve improvements might result from rigid insistence upon an air gap. Such installations must be made under strict limitations. Not all vacuum breakers are suitable.

Failure of water pressure is more likely to occur on upper floors than on lower ones. Therefore, in correcting existing submerged inlets, the work might well start at the top of the building and progress downward, until the entire plumbing system has been safeguarded.

In low-cost houses, the use of soil stacks 3" in diameter will usually be possible and desirable. Stacks of this size permit economies in construction of walls and partitions, as well as in the plumbing.

A code prepared by the late Professor George C. Whipple and associates,² states that a 3" soil stack could take care of as many as 8 bathrooms of the type here considered, each containing one water-closet, one tub, and one lavatory. Thus, if 2 bathrooms adjoin on a floor, one stack of this size could serve a 4 story tier of bathrooms. Four kitchen sinks, one above the other, would require only a 1½" waste stack under this code. Thus, for low-cost buildings, 4 stories or less in height, 4" partitions would suffice even where they must contain soil and waste stacks.

In apartment buildings for low-wage earners, the tenants expect to use a common laundry. Such facilities are quite likely to be placed in the basement. Floor drains in such locations will be kept sealed well enough by the water which inevitably spills on the floor, without the use of special devices to maintain the seal.

The possibility of flooding basements with sewage during storms should not be overlooked. If sewers are likely to be overloaded, some automatic device should be installed to keep the basement dry. Overloading is likely to occur in slum clearance projects where the sewers are old and in poor repair, and where large, densely populated, low-cost developments replace small, old buildings.

If the flooding of sewers is not prolonged, it may be sufficient to use an automatic back-water valve on the house drain, with the rain water downspouts connected between this valve and the street sewer. These valves may be either hydraulically or electrically operated, and controlled by floats or electrodes.

If flooding of street sewers is prolonged, the discharge from fixtures in the building itself may cause sewage to back up into the basement while the back-water valve is closed. In such a case, it is best to build more adequate sewers. Failing in that, the next best thing is to have basement fixtures drain to a sump equipped with an automatic sewage pump or ejector. Hydraulic ejectors are dangerous for use because of the likelihood of direct cross-connections between the drinking water system and the sewer. Electrically driven pumps or ejectors operated by compressed air are to be preferred.

Special thought should be given to maintenance costs of house drains. While extra heavy cast iron pipe costs more at first, it is less likely to give trouble and involve future expenses.

If refrigeration is furnished from a central ice plant, the problem may arise as to the re-use of the condenser water. Water which has been used for any purpose in a building should not thereafter be used for drinking purposes. One should guard against the possibility that the condenser may drain directly to the sewer, constituting a dangerous cross-connection and inviting outbreaks of water-borne diseases.

Economies may be made, under certain favorable conditions, in venting soil and waste pipes by the use of circuit or loop vents. One should make sure, however, that the loop vent will perform its function.

The code² above mentioned states: "A branch soil or waste pipe to which two and not more than eight water-closets, pedestal urinals, trap standard slop sinks, or shower stalls are connected in the series may be vented by a circuit or loop vent, which shall be taken off in front of the last fixture connection." Whether any money can be saved by loop venting is largely dependent upon the individual arrangement of fixtures.

An item sometimes overlooked is the possibility of sewer pipes passing over uncovered water tanks or places where ice, beverages, or foods are stored, handled, or prepared. Although the pipes may be tight when first installed and inspected, they eventually corrode and leak, leading to contamination of water, ice, or food below.

Plumbing codes, generally speaking, need to be brought up to date, both to protect public health and to permit uses and materials which will give better and more lasting plumbing.

REFERENCES

1. Dawson, Dean F. M. Progress Report on Research. *The Ladle*, 13, 6:19 (June), 1937.
2. *Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings*, by Sub-committee on Plumbing of the Building Code Committee, George C. Whipple, Chairman; Elimination of Waste Series, U. S. Department of Commerce, 1924.

Housing and Health*

ROLLO H. BRITTEN, F.A.P.H.A.

Senior Statistician, Division of Public Health Methods, National Institute of Health, U. S. Public Health Service, Washington, D. C.

WHAT is the connection between housing and public health? What is the importance of better housing in the United States today? How does the housing problem fit into the general sociological and economic situation? For these things are the health officer's concern once he attempts to deal with this problem.

I like to think of housing as the home environment of the person, and health as a state of physical, mental, and social efficiency. The intimate relation of these things is obvious. And this committee, in framing hygienic standards for housing, is also thinking in these broad terms.

We know that the population living under adverse housing conditions is to an extent a selected population, is subject to much chronic ill health, and is handicapped by all the concomitants of low income. In a recent paper, DallaValle¹ discusses several of the factors which are related to sickness and death rates in slum areas, namely, decreased opportunities for self improvement, poor housing, malnutrition, lack of medical care, and exposure to unhealthful occupations. Hence, it must be recognized that the observed excess

in illness and mortality rates in slum areas cannot be blamed entirely, perhaps not even chiefly, on the housing²; nor can we today evaluate precisely the part that housing itself plays. However, it is not the only health problem of the low income groups and, although they would surely be entitled to decent housing even if health were not involved, there is certainly every justification for an active participation in the housing field by health authorities.³ It is only necessary to list the essentials of a healthful home environment to show the close connection: a pure and sufficient supply of water, sanitary sewage disposal, sufficient ventilation, heat, and light, space enough for ordinary family demands, absence of excessive dampness, screening against flies and mosquitoes, freedom from fire and other risks of accidents, adequate playgrounds and sunshine for children. In essence, the committee will deal with all those factors in the home environment which affect physical, mental, or social efficiency.

The varying nature of the housing problem in metropolitan areas, in other large cities, in towns, in rural areas, in different parts of the country, makes any adequate summary of the housing situation today quite impossible in a brief discussion. The urban Real Property Inventory of the Department of

* Read at a Special Session of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

Commerce brings this out very strikingly.⁴ For instance, the percentage of dwelling units with more than one person per room was 40 in Charleston, S. C., and 7 in Portland, Ore. The percentage of units with no private toilets was 49 in Charleston and 2 in Burlington, Vt. Many other housing factors showed wide variations. Although no single, typical picture can be presented, some idea of the situation can be gained from the percentages for the median city for each of several distributions. The survey covered all homes in 64 medium sized and small cities, there being at least one city represented in each state.

Seventeen per cent of dwelling units had more than one person per room.

Eight per cent had no running water.

Nineteen per cent had no inside private toilets.

Twenty-six per cent had no privately used bathtub or shower.

Six per cent were without electricity or gas for lighting.

The median age of the dwellings was from 20 to 25 years.

Thirty-two per cent were multiple.

Seven per cent were vacant at the time of the survey (1934).

Seven per cent had extra families from choice or necessity.

As to rural housing, interesting parallel data are available from the survey of the Bureau of Home Economics of the Department of Agriculture, 1933-1934.⁵ The figures I am using are for the median state in each distribution.

Ninety per cent of dwellings had no inside flush toilets.

Seventy-seven per cent were without a piped-in water supply.

Eighty-five per cent were without bathtubs.

Fourteen per cent were 50 years of age or older.

The data on housing obtained in the National Health Inventory of the Public Health Service (1935-1936) have not been completely analyzed, but what are available form a valuable supple-

ment to the preceding figures. For all cities surveyed 16 per cent of the households were found to have more than 1 person per room, 6 per cent more than 1½ persons per room, and nearly 4 per cent 2 or more persons per room. This index of crowding is used as the only one available, but with a realization of its ambiguity.

It is interesting that the size of the city, *per se*, did not seem to make much difference in the index, the small places showing as much congestion, on the average, as the large.

However, as in the Real Property Inventory, there was wide variation from city to city. At one extreme lies a city with 40 per cent of the families having more than 1 person per room; at the other extreme lies a city with less than 3 per cent of its families in this category. Part of the spread is due to varying proportions of the colored population in different cities; but even for white families, the differences were very marked, about one-third of the cities showing percentages of 20 or more over 1 person per room, and another third with percentages under 10. Equally wide variations are found for the more severe degrees of congestion.

As I said, color was an important factor associated with overcrowding. For the colored families in the southern cities surveyed, 37 per cent had more than 1 person per room, against 20 for the white; 21 per cent had more than 1½ persons per room, against 8 for the white; 16 per cent had 2 or more persons per room, against 6 for the white. In northern cities there was a similar contrast.

Congestion, as measured by this index, was greatest in the South (even for the white families) and lowest on the west coast.

In the income group under \$1,000, which constituted nearly 40 per cent of

the white persons surveyed, 21 per cent of such households showed more than 1 person per room, 8 per cent more than $1\frac{1}{2}$, 5 per cent 2 or more. What can happen in an emergency is well indicated by the degree of overcrowding in the relief population during 1935. For white families, 32 per cent had more than 1 person per room, 14 per cent more than $1\frac{1}{2}$, 8 per cent 2 or more. In the southern cities, congestion was marked in relief families, the figures being 50, 29, and 22, respectively for the white households, and 52, 34, and 27 for the colored.

This statistical description is admittedly inadequate, especially in showing the extent to which housing standards recommended by this committee are not now in general practice; but it does show the wide variations in the problem from city to city and in rural areas, the importance of the housing conditions of the Negro, the widespread existence of sub-standard housing and overcrowding, and the necessity of considering the remodelling of old houses as well as the construction of new—the importance of applying sanitary regulations to existing structures.

Comparison between housing conditions today and those of the past is very difficult. Sanitary conditions have improved, but most studies do not show much improvement in other directions. There is also an ominous note in the unemployment problem. Technological changes, the difficult position of the unskilled worker in competition with machinery, changed trade relations with the rest of the world, make it probable that unemployment will continue as a major problem under present social conditions—and point a direct need for public housing, such as may be expected to develop under the new act passed in the closing days of Congress.

To me, the failure of society appreciably to improve housing conditions

in many years in this country means one thing—that health authorities must coöperate with organized labor in meeting this problem, because the persons who are going to live in the houses are the ones most directly concerned in furthering housing reform. Equally it is a challenge to organized labor to develop an increasing interest and expertness in this field.⁶ The coöperative housing movement in Sweden is of particular relevancy in this connection.

The likelihood of a housing shortage still greater than that in existence now requires a word. If we define *need* as the effective economic demand for houses, we still reach estimates that are really astounding. Terborgh's⁷ estimate for new dwelling units is 3,775,000 by 1941; Brookings Institution⁸ 4,500,000 by the same time; Ernst Kahn's⁹ 9,400,000 by 1945. All of these estimates are carefully worked out, giving consideration to many factors. Will building keep pace with that demand? We know that the number of non-farm homes constructed annually dropped from 933,000 in 1925 to 53,000 in 1934. In 1936 the figure had risen to 270,000. Terborgh believes that the average for the next 5 years is not likely to reach the 750,000 required by the above estimate and that we are therefore probably in for a period of housing deficiency perhaps parallel with the worst period after the World War. It should be emphasized that these estimates have to do solely with the economic demand, not with the social need.

The social need is perhaps best indicated by considering the economic conditions of the population in relation to the cost of housing. In the cities tabulated from the National Health Inventory data, about 40 per cent of the persons were in families receiving incomes of less than \$1,000 per year and 80 per cent were in families receiving less than \$2,000. This was in 1935 and

some improvement is to be expected, but with recovery also go increasing prices. What income is necessary under present conditions to provide decent housing, adequate nutrition, sufficient clothing, proper medical care, is debatable; but it is evident from these figures that a large proportion of the population of this country are not receiving adequate incomes to insure a suitable standard of living. Housing is only one symptom of this maladjustment. It must be attacked as a symptom, but not without realizing that the underlying issue is that of securing a better distribution of income, a higher relative wage scale for the working men, and

greater security against the disastrous effects of depressions.

REFERENCES

1. DallaValle, J. M. Some Factors Which Affect the Relationship between Housing and Health. *Pub. Health Rep.*, 52, 30 (July 23), 1937.
2. Britten, Rollo H. The Relation between Housing and Health. *Pub. Health Rep.*, 49, 44 (Nov. 2), 1934.
3. Winslow, C.-E. A. Housing as a Public Health Problem. *A.J.P.H.*, 27, 1:56 (Jan.), 1937.
4. Department of Commerce. *Real Property Inventory*, 1934.
5. Department of Agriculture, Bureau of Home Economics, *Rural Housing Survey, 1933-1934*.
6. Childs, Marquis W. Sweden. *The Middle Way*. Yale University Press.
7. Terborgh, George. The Present Situation of Inadequate Housing. *Am. Econ. Rev.*, Mar. (Supplement), 1937.
8. Brookings Institution. *Recovery Problem in United States*, Dec., 1936.
9. Kahn, Ernst. *Survey Graphic*, May, 1934.

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

August, 1938

Number 8

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

THE AUTO TRAILER

THE ever present problem of the auto trailer is brought to the fore by the advent of summer. It is true that in a country as large as the United States some sections are concerned with the auto trailers and their inhabitants during the entire year, chiefly the South and Southwest in winter and the North and Northwest in summer, but summer is the great holiday season of the entire year.

As far as we know, no general regulations have been adopted, though some states and some cities have passed laws and ordinances. We are not the only people worried by this new type of migrant. The auto trailer had its origin in Detroit, the great home of the automobile, but has spread to neighboring countries. The Provinces of Canada have found it necessary to adopt regulations. Those of Manitoba¹ passed in 1937 are said to be the basis of those adopted in other parts of Canada. The trailer is known in that country as "auto trailer house" and defined as a "vehicle towed or drawn by an automobile or other means constructed and equipped for the occupation and comfort of persons while traveling from one destination to another."

The great danger from such vehicles is due to the excreta of the inhabitants. Consequently the regulations require that the closets shall be of the removable receptacle type, fly-proof, with proper ventilation and constructed so as to permit proper cleansing and disinfection. The receptacles must be of substantial water-tight metal construction. Sinks and other fixtures used in washing or bathing must also be provided with water-tight metal containers. The use of closets, sinks, wash basins or other fixtures which may permit the discharge of liquid or solid wastes to the ground are strictly prohibited.

The tourist camps, summer resorts, or other locations where trailers are allowed to park shall be adequately provided for the sanitary disposal of all wastes by burial or burning. The use of a common collecting receptacle for the disposal of excreta or other wastes is prohibited. When parked in any city or town where plumbing fixtures and water supplies are provided, the use of the ordinary closets and other such fixtures in trailers is strictly prohibited. Under

no circumstances shall an auto trailer be used as a permanent or occasional place of residence in any city, town, or municipality.

In addition to the regulations mentioned, all trailers and their occupants shall be subject to the provisions and regulations respecting disease control under the Public Health Act.

In England² the health authorities have considerable anxiety over what are known as caravans and caravan encampments. These temporary or movable structures are dumped on sites for use during the summer season and there they remain. Recent decisions as to the liability of such temporary dwellings have placed them clearly under the regulations of the Public Health Act, and they are liable to be dealt with as statutory nuisances as to overcrowding to the prejudice of the health of inmates or if so lacking in proper sanitary accommodations as to give rise to a nuisance prejudicial to health. The Minister of Health is empowered to exempt any camping association which attempts to control its members and to keep the camp site in good sanitary condition. Indeed, so far from bearing down upon the well behaved camper, properly equipped holiday camps and camping sites are fostered in that country.

Some years ago a visiting Englishman described America as a nation on wheels. As we recall it, his impressions were gained from seeing the ordinary automobile. Since that time the number of auto trailers has grown by leaps and bounds and they constitute a real menace to public health along the routes they follow and in the communities where they stop for a longer or shorter time.

REFERENCES

1. Defries, R. D., M.D. Recent Health Legislation in Canada. *Canad. Pub. Health J.*, Apr., 1938, p. 184.
2. *Lancet*, London, Apr. 9, 1938, p. 862.

WHAT WE OWE TO THE FOREFATHERS

A SHORT time ago we called attention to the mistake of binding one's self too much by authority, and quoted from the wisdom of Oliver Wendell Holmes as well as others on the subject. Another danger has been pointed out most strikingly by Osler,¹ who says: "Of the altruistic instincts veneration is not the most highly developed at the present day, but I hold strongly with the statement that it is the sign of a dry age when the great men of the past are held in light esteem."

We are too apt to forget what we owe to the fathers and should always welcome such reminders. Nothing is more irritating than to hear young men speak lightly of the old doctors. It is no doubt true that with the wonderful discoveries made in many fields and the perfection of diagnostic methods through accurate apparatus, the end results are perhaps in the great majority of cases better than the fathers obtained, but it is a question as to whether or not we are producing as good men as they were. One must view with awe and admiration the country doctors: in America, for example, Drake, born in abject poverty and reared in a log cabin, McDowell, Marion Sims, and Crawford W. Long—to go no further. Abroad, we need only mention as a country doctor, Jenner, who has a sure place in the Hall of Fame; Bright, who boiled the urine of nephritics in a spoon, yet who formulated such a clear clinical and pathological conception of nephritis that little was left for later investigators except amplification;

Bretonneau, who differentiated affections of the throat and stated definitely his doctrine of the specificity of diseases in general and "diphthérie" in particular; and many others who had nothing which we would consider a laboratory today, yet, by their wonderful exactness of observation and well trained powers, unraveled problems in a fashion which has not been bettered even to the present. Among these men we find instances of real originality, though it must be borne in mind that the majority of what we consider great discoveries are really the placing of the capital on the column. The most striking example of this, perhaps, is Harvey's discovery of the circulation of the blood. He himself, thoroughly versed in literature, apparently recognized that it was a great contribution to others in the same field, and though he gave the proof which has withstood the test of time, he had to suppose the capillary circulation, and it remained for Malpighi to demonstrate how the blood made its way from the arteries to the veins. Harvey was all of his life an anatomist, and distrusted authority. He said,² "... because I profess both to learn and to teach anatomy not from books but from dissections, not from the positions of philosophers, but from the fabric of nature."

Medical history is full of rediscoveries of things which have been taught and then forgotten. There are many instances in which "the restatement of an important theory or teaching is almost as significant as its original presentation."³ The truth of this emphasizes the necessity of reading the best works of the fathers. "The more one reads the better medical works of past generations, the more astonished one becomes, and the more humble, too, at what has been known and written and then forgotten."³ Vaughan said: "In my opinion, the present-day medical man, including the epidemiologist, is not as fully conversant as he should be with the history of epidemic diseases. As an illustration I may cite the fact that it took us many months to learn facts about the epidemiology of cerebrospinal meningitis that were demonstrated conclusively by French army surgeons in the first half of the nineteenth century."⁴ "... Is cerebrospinal meningitis a rural disease? Certainly every important contribution to its symptomatology, epidemiology, and pathology, found in American medical literature during the time mentioned comes from a country doctor."⁵

This emphasizes the great service which certain writers are giving to the medical world in the reproduction of masterpieces from the past (see Note). Very few of us have the command of languages, to say nothing more, to read these articles in the original. Osler said: "There is a third class of men in the profession to whom books are dearer than to teachers or practitioners—a small, a silent band, but in reality the leaven of the whole lump. The profane call them bibliomaniacs, and in truth they are at times irresponsible and do not always know the difference between meum and tuum. . . . We need more men of this class, particularly in this country, where every one carries in his pocket the tape-measure of utility. Along two lines their work is valuable. By the historical method alone can many problems in medicine be approached profitably."⁶

At the amazing mass of marvelous revelations which are coming to us through research in practically every field of science, the majority of us can only look and wonder. Few there are in any one branch of science capable of selecting the best material and interpreting it for the average man. This is perhaps especially true in regard to medicine. If for no other reason we need the historian, especially the one who is also a bibliomaniac.

NOTE: *Classic Descriptions of Disease*, by Ralph H. Major; *Selected Readings in Pathology*, by Esmond R. Long; *Selected Readings in the History of Physiology*, by John F. Fulton.

REFERENCES

1. Osler. *The Functions of a State Faculty (Society)*, 1897.
2. Harvey. *Exercitatio anatomica de motu cordis et sanguinis in animalibus*.
3. White, Paul D. *Doctors and Books*. *New Eng. J. of Med.*, Feb. 24, 1938, p. 338.
4. Vaughan. *Epidemiology and Public Health*, Vol. I, p. 9.
5. Vaughan. *Epidemiology and Public Health*, Vol. I, p. 348.
6. Osler. *Acquaintance and Other Addresses*, "Books and Men," p. 222.

LETTER TO THE EDITOR

TO THE EDITOR:

My attention has been called to two errors in the 1937 Report of the Committee on Water Supply of the Public Health Engineering Section which should be corrected. This report was published in the 1937-1938 *Annual Year Book* of the Association, pages 137-156 inclusive, Supplement to *American Journal of Public Health*, Volume 28, No. 2 (February), 1938.

In the first column, page 145, in a list of 14 states reporting no water-borne outbreaks "during the last 7 years," Mississippi should be deleted and Louisiana substituted.

On page 155, first column, under the sub-title "Outbreaks in Cities Having Filtration Plants," the information submitted to the Committee with regard to the Ft. Wayne, Ind., outbreak of April-Sept., 1934, does not justify the statement . . . "it appears probable that . . . a situation developed similar to the one which caused the explosive outbreak of gastroenteritis in Detroit in 1926, when the quantity of chlorine applied to the filtered water was not sufficient to satisfy the chlorine demand and also permit proper disinfection during a period when a highly polluted raw water was being treated."

The Bureau of Sanitary Engineering of the Indiana State Board of Health

from which the committee obtained information concerning this outbreak reports "our investigation showed conclusively, that the water filtration plant was not responsible for this outbreak."

In the statistical tables given in this report, the Ft. Wayne outbreak of 1934 was properly listed under classification H-3 "Cause of Outbreak Undetermined."

As chairman of the committee which submitted this report, I sincerely regret these errors and request that the above statement of correction be published at an early date in the *American Journal of Public Health*.

For the information of all who read the original report or reprints of it, the committee desires again to emphasize that this report does not deal *only* with water-borne outbreaks involving public water supplies, but with *all* water-borne outbreaks which came to the committee's attention where five or more persons were known to have been ill.

Very truly yours,

ARTHUR E. GORMAN,
Chairman,

Committee on Water Supply (1937)
Public Health Engineering Section
American Public Health Association
June 22, 1938.

PRELIMINARY PROGRAM OF THE
SIXTY-SEVENTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

KANSAS CITY, MO., OCTOBER 25-28, 1938

THE Annual Meeting Program Committee presents the Preliminary Program of the scientific sessions of the Sixty-seventh Annual Meeting of the American Public Health Association and information concerning meetings of related organizations.

This program is incomplete and perhaps inaccurate in some respects. The affiliations of speakers have been omitted, but will be published in full in the Final Program. Delegates are urged to consult the Final Program, available at the Registration Desk in the Auditorium at the time of the meeting.

Tuesday, 9:30 A.M.

LABORATORY

First Session—Room 500, Auditorium

Address of the Chairman. FRIEND LEE MICKLE, SC.D.

Report of the Coördinating Committee on Standard Methods.
Chairman, LIEUTENANT COLONEL A. PARKER HITCHENS, M.D.

Report of the Standard Methods Committee on Examination of Water and Sewage. *Chairman, JOHN F. NORTON, PH.D.*

Report of the Standard Methods Committee on Examination of Dairy and Food Products. *Chairman, ROBERT S. BREED, PH.D.*

Report of the Standard Methods Committee on Diagnostic Procedures and Reagents. *Chairman, WILLIAM D. STOVALL, M.D.*

Report of the Standard Methods Committee on the Biology of the Laboratory Animal. *Chairman, LIEUTENANT COLONEL RAYMOND A. KELSEY, PH.D., D.V.M.*

Report of the Standard Methods Committee on Analyzing Frozen Desserts. *Chairman, FRIEND LEE MICKLE, SC.D.*

Report of the Committee on Biological Products. *Chairman, ELLIOTT S. ROBINSON, M.D., PH.D.*

Report from the Section Archivist. AUGUSTUS B. WADSWORTH, M.D.

Reports of Representatives of Committees Outside of the Laboratory Section and Other Special Reports.

Section Business.

Tuesday, 9:30 A.M.

HEALTH OFFICERS

First Session—Room 600, Auditorium

The Interests and Problems of the Health Officers' Section. GREGOIRE F. AMYOT, M.D., D.P.H.

Opportunities Under the Federal Housing Acts. C.-E. A. WINSLOW, DR. P.H.

An Analysis of Tenures of Office of Health Officers. JOSEPH W. MOUNTAIN, M.D., and ELLIOTT H. PENNELL.

The Objectives of Health Departments. GEORGE C. RUHLAND, M.D.

VITAL STATISTICS

First Session—Room 400, Auditorium

The Effectiveness of Different Systems of Collecting Vital Statistics Data. J. V. DEPORTE, PH.D.

Discussion. MRS. J. B. COLLIE and RICHARD N. WHITFIELD, M.D.

The Value of the Vital Statistics Data on Birth and Death Certificates in County Health Work. EARLE G. BROWN, M.D.

Social Security Needs for Vital Statistics Records. I. S. FALK, PH.D.

Discussion. THOMAS W. CHAMBERLAIN.

The Use of Marginal Punch Cards in Tabulating Vital Statistics Data. EVA W. RAMSEY.

System of Record Keeping in Westchester County. MARJORIE T. BELL-OWS.

A Brief Review of the Expected Content of the Demography Exhibit of the New York World's Fair in 1939. HAVEN EMERSON, M.D.

FOOD AND NUTRITION

First Session—Room 501, Auditorium

Present Status of Dental Caries in Relation to Nutrition. NINA SIMMONDS, Sc.D.

The Selenium Problem and Its Relationship to Public Health. IRA A. MANVILLE, M.D., PH.D.

Effect of Environmental Conditions on Incidence of Dental Caries. BION R. EAST, D.D.S.

Some Nutritional Requirements During Growth. P. C. JEANS, M.D.

Nutritional Status of Dextrose. CARL R. FELLERS, PH.D.

Antirachitic Properties of Constituents of Human Milk. (To be read by title only.) ROBERT S. HARRIS, PH.D., and JOHN W. M. BUNKER, PH.D.

Tuesday, 9:30 A.M.

CHILD HYGIENE

First Session—Music Hall, Auditorium

Illnesses Occurring Among Young Children as Revealed in a Nationwide Survey. GEORGE ST. J. PERROTT.

Discussion.

Dental Health Program for the Child. Speaker to be announced.

Discussion.

Preventive Aspects of Orthopedic Service. Speaker to be announced.

Discussion.

Section Business.

PUBLIC HEALTH NURSING SECTION AND AMERICAN SCHOOL HEALTH ASSOCIATION

Joint Session—Little Theatre, Auditorium

Program to be announced.

EPIDEMIOLOGY

First Session—Room 401, Auditorium

Production of Mottled Enamel Halted by a Change in Common Water Supplies. H. TRENDLEY DEAN, D.D.S., and FREDERICK S. MCKAY, D.D.S.

Results of Contact Investigation in Syphilis in an Urban Community. THOMAS B. TURNER, M.D., ABRAHAM GELPERIN, M.D., and JAMES R. ENRIGHT, M.D.

Epidemiology of Leptospirosis. K. F. MEYER, M.D., PH.D.

Epidemiology of Syphilis in New York City. THEODORE ROSENTHAL, M.D., and JOSEPH WEINSTEIN, M.D., M.S.P.H.

The Syphilitic Chancre from the Point of View of the Public Health. WALTER CLARKE, M.D.

Tuesday, 12:30 P.M.

INDUSTRIAL HYGIENE

Luncheon Session—Roof Garden, Hotel Kansas City

DELTA OMEGA

Luncheon Session—Junior Assembly Room, Hotel President

Tuesday, 12:30 P.M.

PUBLIC HEALTH EDUCATION

Luncheon Session—Congress Room, Hotel President

Is the Health Educator Culturally Qualified to Teach? Speaker to be announced.

Tuesday, 2:30 P.M.

PUBLIC HEALTH EDUCATION

First Session—Room 401, Auditorium

BUILDING A HEALTH EDUCATION PROGRAM

The Use of Morbidity and Mortality Statistics. Speaker to be announced.

The Use of Exhibits, Posters and Charts. HOMER N. CALVER.

The Preparation and Use of Printed Materials, Newspaper Publicity, Lectures, Radio and Movies. Speaker to be announced.

Interpreting the Physician and Making Him a Part of a Health Education Program. MARY P. CONNOLLY.

How to Fit a Special Problem Like Syphilis into the Balanced Program. WILLIAM F. SNOW, M.D.

Discussion.

PUBLIC HEALTH ENGINEERING SECTION AND CONFERENCE OF STATE SANITARY ENGINEERS

Joint Session—Little Theatre, Auditorium

Presiding: WARREN J. SCOTT.

House Trailer and Trailer Camp Sanitation. (Report of the Joint Committee on Summer Camps and Roadside Places.) *Chairman,* CARL E. GREEN, C.E.

Existing Systems of Supervision and Control Over Water Supplies and Needed Improvements Thereto. (Preliminary Report of the Committee on Water Supply.) ANSELMO F. DAPPERT.

Irrigation as a Means of Disposal for Sewage Effluents. VICTOR M. EHLERS, C.E.

Discussion. BENJAMIN V. HOWE.

Venting of the Plumbing Drainage System. F. M. DAWSON, M.C.E., and A. A. KALINSKE.

Report of the Joint Committee on Plumbing. *Chairman,* JOEL I. CONNOLLY.

Procedures Recommended for Determining the Extent of Closed Shellfish Areas. (Report of the Committee on Shellfish.) *Chairman,* L. M. FISHER, C.E., D.P.H.

Tuesday, 2:30 P.M.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Joint Session—Music Hall, Auditorium

Presiding: FRIEND LEE MICKLE, Sc.D., and J. A. DOULL, M.D., Dr.P.H.

PERTUSSIS

Essential Problems in Pertussis. HAVEN EMERSON, M.D.

A Controlled Study in Pertussis Immunization. PEARL L. KENDRICK, Sc.D., and GRACE ELDERING, with Statistical Assistance of ANTHONY J. BOROWSKI, Dr.P.H.

An Evaluation of Phase I H. Pertussis Vaccine in Laboratory and Clinic. J. J. MILLER, JR., M.D.

Complement Fixation Studies in Pertussis. THOMAS F. SELLERS, M.D.

Immunity Studies in Pertussis. GEORGE McL. LAWSON, M.D., Dr.P.H.

INDUSTRIAL HYGIENE

First Session—Room 400, Auditorium

SYMPOSIUM ON INDUSTRIAL HYGIENE ADMINISTRATION

Address of the Chairman of the Section: Development of Industrial Hygiene in the United States. J. J. BLOOMFIELD.

Health Maintenance in Industry. CLARENCE D. SELBY, M.D.

Discussion. WILLIAM A. SAWYER, M.D.

Industrial Hygiene Program in a State Health Department. CARL A. NAU, M.D.

Discussion. MANFRED BOWDITCH.

CHILD HYGIENE AND FOOD AND NUTRITION SECTIONS

Joint Session—Room 600, Auditorium

Presiding: D. BREESE JONES, Ph.D.

Clinical Tests of Vitamin Deficiency. (Report of the Committee on Nutritional Problems.) *Chairman,* WALTER H. EDDY, Ph.D.

Malnutrition: A Challenge and Opportunity. H. D. KRUSE, M.D., and FRANK G. BOUDREAU, M.D.

Training of the Public Health Nutritionist. LYDIA J. ROBERTS, Ph.D.

A Comparison of Indices Used in Judging Nutritional Status of School Children. R. M. JENNS, Sc.D.

Some Objectives and Results of Public Health Nutrition in Kansas. PEARL ROFABAUGH, R.N.

The County Public Health Nutrition Project in Georgia. T. F. ABERCROMPIE, M.D.

The Child's Requirement for Calcium and His Ability to Utilize Calcium from Various Sources. JULIA OUTHOUSE, Ph.D.

Tuesday, 2:30 P.M.

PUBLIC HEALTH NURSING

First Session—Room 501, Auditorium

MILESTONES

Milestones of the Past Fifteen Years. DOROTHY DEMING, R.N.

Milestones and Yardsticks. MICHAEL M. DAVIS, PH.D.

Program of the Future. GEORGE C. RUHLAND, M.D.

Preparation of the Nurse of the Future. LEAH M. BLAISDELL, R.N.

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

First Session—Aztec Room, Hotel President

Reports of Committees.

Election of Officers.

Tuesday, 6:30 P.M.

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Dinner Session—Junior Assembly Room, Hotel President

Tuesday, 8:00 P.M.

FIRST GENERAL SESSION

Music Hall, Auditorium

Presiding: ARTHUR T. McCORMACK, M.D., D.P.H., D.Sc., LL.D., President,
American Public Health Association.

Addresses of Welcome.

Address. THOMAS PARRAN, M.D., D.Sc., LL.D., DR.P.H.

Address. Speaker to be announced.

Announcement of Sedgwick Memorial Medal Award.

Reception to the President and the President-elect.

Dancing—Little Theatre, Auditorium.

Wednesday, 8:00 A.M.

JOHNS HOPKINS UNIVERSITY ALUMNI

Breakfast Session—Trianon Cafe, Hotel Muehlebach

Wednesday, 8:00 A.M.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY ALUMNI

Breakfast Session—Tea Room, Hotel Muchlebach

Wednesday, 9:30 A.M.

HEALTH OFFICERS

Second Session—Music Hall, Auditorium

Developments in the New York State Tuberculosis Program. ROBERT E. PLUNKETT, M.D.

SYMPOSIUM ON VENEREAL DISEASE CONTROL

The Results of Venereal Disease Control in Toronto. GORDON BATES, M.D.

The Control of Venereal Diseases in a Southern Rural Area. L. E. BURNEY, M.D.

Blood Tests for Syphilis "Boiled Down." JOHN F. MAHONEY, M.D.

LABORATORY

Second Session—Room 500, Auditorium

Presiding: WILLIAM D. STOVALL, M.D.

DIAGNOSTIC METHODS

Modifications of Gram's Technic with a New Differential Counterstain.

(a) For Direct Smear. (b) For formalin-fixed tissue. SARA A. SCUDDER.

Laboratory Diagnosis of Rabies. THOMAS F. SELLERS, M.D.

Evaluation of Technical Procedures for the Examination of Specimens for Evidence of Enteric Disease. MARION B. COLEMAN.

Further Observations of the Primary Isolation of Tubercle Bacilli by Cultural Method. A. L. MACNABB, D.V.M.

Serological Tests in the Diagnosis of Syphilis. ELIZABETH MALTANER.

LABORATORY

Third Session—Room 201, Auditorium

Comparative Study of Bacteriological Examinations of Restaurant Utensils. OTTO P. BEHRE.

Spinal Fluid Changes in Neuro-Syphilis. CARL LANGE, M.D.

A Comparative Study of the Mouse and Guinea Pig Inoculation—Methods in the Diagnosis of Rabies. S. E. SUTKIN, and JOSEPH C. WILLIET, D.V.M.

Fifteen Years of the Standard Kahn Test. RUTHEN L. KAHN, Sc.D.

Experimental Infection of *Dermacentor Andersoni* Stiles with the Virus of Lymphocytic Choriomeningitis. ALFRED MILLER and HOWARD J. SHAUGHNESSY, Ph.D.

Wednesday, 9:30 A.M.

PUBLIC HEALTH ENGINEERING

First Session—Room 400, Auditorium

SYMPOSIUM ON THE EXPANDING FIELD OF PUBLIC HEALTH ENGINEERING

The Projection of Public Health Engineering Service in New York State. W. H. LARKIN, C.E.

Districting New Mexico for Sanitation. PAUL S. FOX, C.E.

Engineering Service in City Departments of Health. (Report of the Committee on Municipal Public Health Engineering.) *Chairman*, SOL PINCUS, C.E.

Organization for Public Health Engineering Service in a Rural-Urban Area. WILLIAM T. INGRAM.

(Session continued in the afternoon.)

CHILD HYGIENE

Second Session—Room 401, Auditorium

MATERNAL AND CHILD HEALTH

Use of Birth and Death Records as a Method in Controlling Early Infant Deaths. THOMAS J. DUFFIELD.

Discussion.

Control of Rickets Among Infants Living in Large Cities. JULIUS LEVY, M.D.

Discussion.

Obstetric Service in a Rural Community. Speaker to be announced.

Discussion.

Advances Made in the Federal Program for Maternal and Child Health. MARTHA M. ELIOT, M.D.

Discussion.

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Second Session—Junior Assembly Room, Hotel President

Reports of Committees.

Confidentialness of Records. LEONARD V. PHELPS and FRANK MORRISON.

Wednesday, 9:30 A.M.

PUBLIC HEALTH EDUCATION

Second Session—Little Theatre, Auditorium

SYMPOSIUM ON OUTPOSTS OF RESEARCH AND NEW FACTS FOR THE HEALTH EDUCATOR

Introduction.

Why the Health Educator Should Keep Abreast of Developments in Medicine and How He May Do That. IAGO GALDSTON, M.D.

Mental Hygiene in the Past Decade. Speaker to be announced.

Advances in Our Knowledge of Nutrition. FRANKLIN C. BING, M.D.

Newer Methods of Dealing with Prevention, Detection, and Control of Pneumonia. Speaker to be announced.

Newer Research Findings for Dealing with Syphilis and Gonorrhea. WALTER CLARKE, M.D.

Discussion.

PUBLIC HEALTH NURSING

Second Session—Room 600, Auditorium

THE STATE HEALTH DEPARTMENT AND ITS RELATION TO ALL PUBLIC HEALTH NURSING WITHIN THE STATE

The State Public Health Nursing Service as Seen by a Nonofficial Agency. ALMA C. HAUPT, R.N.

The State Public Health Nursing Unit and Its Relation to the Special Services. JANE D. NICHOLSON, R.N.

The Private Public Health Nursing Agency and Its Relationship to the State Public Health Nursing Service. ALEXANDRA MATHESON, R.N.

Interrelationships—University Courses of Study and State Nursing Service. Speaker to be announced.

EPIDEMIOLOGY

Second Session—Room 501, Auditorium

Rocky Mountain Spotted Fever and Tick Survey in Iowa. CARL F. JORDAN, M.D., C.P.H.

Nosocomial Infections in an Infants' Hospital. ARTHUR P. LONG, M.D., CHARLES F. MCKHANN, M.D., and LUCILE L. CHENEY.

Paratyphoid Fever in Massachusetts. ROY F. FREEMSTER, M.D., DR.P.H.

Probable Typhoid Carrier Incidence in Mississippi. A. L. GRAY, M.D.

Discussion. F. C. FORSBECK, M.D.

Factors Influencing Nonspecific Resistance to Infection. CHARLES F. CRUFCH, M.D.

Wednesday, 12:30 P.M.

FOOD AND NUTRITION

Luncheon Session—Aztec Room, Hotel President

Report of the Committee on Bioassay Methods for Vitamin D Milk.
Chairman, HENRY T. SCOTT, PH.D.

Report of the Committee on Participation in Standard Methods.
Chairman, FRED C. BLANCK, PH.D.

Report of the Committee on Fellowship and Membership. *Chairman,*
ABRAHAM LICHTERMAN, PHAR.D.

PUBLIC HEALTH NURSING

Luncheon Session—Congress Room, Hotel President

Presiding: PHYLLIS M. DACEY, R.N.

An Engineer Looks at Public Health Nursing. *ABEL WOLMAN, DR.ENG.*

Section Business.

Wednesday, 2:30 P.M.

PUBLIC HEALTH ASPECTS OF MEDICAL CARE

Special Session—Music Hall, Auditorium

Program to be announced.

VITAL STATISTICS SECTION AND AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Joint Session—Junior Assembly Room, Hotel President

The New Form of Certificate. *HALBERT L. DUNN, M.D., PH.D.*

Discussion. IRVA C. PLUMMER and WILLIAM R. TRACEY.

Testing Completeness and Accuracy of Registration of Births and Deaths.

(a) Results of Experience with Different Methods of Testing Registration in Texas Under Varied Local Conditions. *W. A. DAVIS, M.D.*

(b) A Comparison of the Effectiveness of Different Methods of Testing Registration in the Same Area in Maryland. *ARTHUR W. HEDRICH, SC.D., FRANCIS D. RHODES, and JOHN COLLINSON, M.D., DR.P.H.*

Discussion. P. K. WHELPTON and Jo C. ROSE.

The Coroner's Situation. *S. R. GERBER, M.D.*

Discussion. R. T. STIMPSON, M.D.

Wednesday, 2:30 P.M.

LABORATORY AND FOOD AND NUTRITION SECTIONS

Joint Session—Room 600, Auditorium

Presiding: FRIEND LEE MICKLE, Sc.D., and FREDERICK W. FABIAN, Ph.D.

SYMPOSIUM ON FROZEN DESSERTS

What Are Frozen Desserts? FREDERICK W. FABIAN, Ph.D.

The Quality of Gelatin as a Stabilizer in Ice Cream. JAMES GIBBARD.

Sanitation of Products Added to Frozen Desserts. P. H. TRACY, Ph.D.

Sediment Tests in Frozen Desserts. MILTON E. PARKER.

Public Health Aspects of Fruits, Nuts, Colors and Extracts. MARTIN J. PRUCHA, Ph.D.

Notes on Ice Cream Analysis. A. H. ROBERTSON, Ph.D.

Brief Reports of Associate Referees:

Eggs. LAWRENCE H. JAMES, Ph.D.

Sugar. HARLOW H. HALL.

Dry Milk. PAUL S. PRICKETT, Ph.D.

Condensed and Evaporated Milk. P. A. DOWNS, Ph.D.

LABORATORY

Fourth Session—Room 500, Auditorium

Presiding: THOMAS F. SELLERS, M.D.

TYPHOID FEVER

Evaluation of Procedures for Isolation of Typhoid Bacilli in Public Health Laboratories. HERBERT E. MCDANIELS, Ph.D.

Efficacy of Immunization in an Acute Water-Borne Outbreak of Typhoid Fever. CHARLES D. BOWDOIN, M.D., C.P.H.

Progress Report on Studies of: Strains of *Eberthella Typhosa* for the Preparation of Vaccine, Duration of Immunity, and Results of Revaccination. LIEUTENANT COLONEL GEORGE C. DUNHAM, M.D.

PUBLIC HEALTH ENGINEERING

Second Session—Room 501, Auditorium

SYMPOSIUM ON THE EXPANDING FIELD OF PUBLIC HEALTH ENGINEERING

(Continued from morning session)

Potentialities of Public Health Engineering in Relation to the Social Security Act. ROY J. MORTON.

Educational Opportunities for the Public Health Engineer and Sanitarian. HARRY E. MILLER.

Supplementary Education of Milk Inspectors. (Report of the Joint Committee on Milk Supply.) *Chairman,* WALTER VON D. TILDENMAN, M.C.E.

The Rôle of the Public Health Engineer in Public Health Administrative Work. MURRAY P. HOEWOOD, Ph.D.

Discussion. ARTHUR WOLMAN, Dr.Eng.

Wednesday, 2:30 P.M.

INDUSTRIAL HYGIENE

Second Session—Room 401, Auditorium

CONTROL OF INDUSTRIAL HAZARDS

The Safe Operation of Degreasing Tanks Employing Trichlorethylene.

W. B. HARRIS, CH.E., C. B. FORD, and F. A. PATTY.

Discussion. HENRY FIELD SMYTH, M.D., DR.P.H.

Industrial Hygiene Codes. JAMES R. ALLAN.

Discussion.

The Effect on Health of Gases Produced by the Electric Arc. LEROY

W. LATOWSKY.

Discussion.

Wednesday, 6:30 P.M.

VITAL STATISTICS

Anniversary Dinner—Congress Room, Hotel President

PUBLIC HEALTH ENGINEERING AND CONFERENCE OF STATE SANITARY ENGINEERS

Annual Engineers' Stag Dinner—Banquet Hall, Hotel Muehlebach

PUBLIC HEALTH EDUCATION

Dinner Session—Trianon Cafe, Hotel Muehlebach

Closed Session—For Fellows of the Section Only

Address. Speaker to be announced.

Wednesday, 8:00 P.M.

PUBLIC MEETING

Sponsored by the Local Committee, the Jackson County Health
Forum, and the Jackson County Medical Society

Special Session—Music Hall, Auditorium

Presiding: EDWIN H. SCHORER, M.D., DR.P.H.

Vitamins. E. V. MCCOLLUM, PH.D.

Address. ARTHUR T. MCCORMACK, M.D., D.P.H., D.Sc., LL.D., President,
American Public Health Association.

Thursday, 8:00 A.M.

THE AMEROPS

Breakfast Session—Music Room, Hotel Muehlebach

Thursday, 8:00 A.M.

HARVARD UNIVERSITY ALUMNI

Breakfast Session—Trianon Cafe, Hotel Muehlebach

YALE UNIVERSITY ALUMNI

Breakfast Session—Tea Room, Hotel Muehlebach

Thursday, 9:30 A.M.

HEALTH OFFICERS AND PUBLIC HEALTH NURSING SECTIONS

Joint Session—Music Hall, Auditorium

Is the Health Officer Fulfilling His Responsibilities in Relation to the Nursing Program? GRACE ROSS, R.N.

A Critical View of Nurses and Nursing Programs. FELIX J. UNDERWOOD, M.D.

Discussion. HUNTINGTON WILLIAMS, M.D.

Administrative Policies that Interfere with Effective Public Health Procedures. MAYHEW DERRYBERRY, PH.D.

A Program of Maternal Care in a Rural County. EARL P. BOWERMAN, M.D., and W. FRANK WALKER, DR.P.H.

LABORATORY

Fifth Session—Room 201, Auditorium

Presiding: JOHN F. NORTON, PH.D.

WATER AND SEWAGE

Uses and Abuses of Biochemical Oxygen Demand. M. STARR NICHOLS, PH.D.

Symposium on Slow Lactose Fermenters. Speakers to be selected.

LABORATORY

Sixth Session—Room 401, Auditorium

Correlation of Laboratory Studies on Diphtheria Immunization Methods and Their Possible Practical Application. F. G. JONES.

Mass Immunization against Diphtheria with Sordelli's Activated Toxoid and Contact Immunization. ALBERTO P. LEON, M.D., M.P.H.

Diphtheria in Tennessee. C. B. TUCKER, M.D., C.P.H.

The Diphtheria Immunization Studies in Saginaw. V. K. VOLE, M.D., and W. E. BUNNEY, PH.D.

Subject and Speaker to be announced.

Subject and Speaker to be announced.

Thursday, 9:30 A.M.

VITAL STATISTICS

Second Session—Room 500, Auditorium

Objectives of the Section. JESSAMINE S. WHITNEY.

Report of the Committee on Accident Statistics. *Chairman*, ROBERT J. VANE.

Report of the Committee on Forms and Methods of Statistical Practice. *Chairman*, ARTHUR W. HEDRICH, Sc.D.

Report of the Committee to Study Death Certification. *Chairman*, MARJORIE T. BELLOWS.

Report of the Committee on Residence Allocation. *Acting Chairman*, ELIZABETH PARKHURST.

The Vital Statistics of the Pueblo Indians. J. H. WATKINS, Ph.D., S. D. ABERLE, M.D., and E. H. PITNEY.

A Time Study of Morbidity and Mortality in the United States Navy. J. M. WHEELIS, JR., M.D.

Section Business.

PUBLIC HEALTH ENGINEERING

Third Session—Room 400, Auditorium

The Measurement of Sanitary Ventilation. Part II. WILLIAM F. WELLS.

Recent Developments in Waterways Pollution Control. (Report of the Committee on Waterways Pollution.) *Chairman*, LOUIS F. WARRICK, Ch.E.

The Occurrence, Pathological Aspects and Treatment of Fluoride Wastes. M. STARR NICHOLS, Ph.D.

Practical Procedures and Limitations in Present-Day Smoke Abatement. HARRY B. MELLER.

Progress Report of the Committee on Industrial Sanitation. *Chairman*, CHARLES L. POOL.

FOOD AND NUTRITION

Second Session—Room 501, Auditorium

The Food Control Exhibit at the New York World's Fair, 1939. SAMUEL C. PRESCOTT, D.Sc.

The Nutrition Exhibit at the New York World's Fair, 1939. WALTER H. EDDY, Ph.D.

Symposium on Public Health Problems in Packing Meat and Shellfish. Speakers to be announced.

Thursday, 9:30 A.M.

CHILD HYGIENE SECTION AND AMERICAN
SCHOOL HEALTH ASSOCIATION

Joint Session—Little Theatre, Auditorium

SYMPOSIUM ON NEXT STEPS IN SCHOOL HEALTH SERVICES

Program to be announced.

EPIDEMIOLOGY

Third Session—Room 600, Auditorium

Results Obtained in the Program of Tuberculin Testing of Persons Residing in Congested Areas of a Large City. BRUCE H. DOUGLAS, M.D., and GAUS E. HARMON, M.D.

Epidemiology of Epidemic Encephalitis in California. HARLEN L. WYNNS, M.D., and CARL J. HAWLEY, M.D.

Preliminary Observations on the Epidemiology of Mental Disease in the Eastern Health District, Baltimore. ALLEN W. FREEMAN, M.D.

Pneumonia Control Program in Pennsylvania. EDITH MACBRIDE-DEXTER, M.D.

The Incidence of Vincent's Infection in the School Children in Kansas. L. R. KRAMER, D.D.S.

Thursday, 12:15 P.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

Luncheon Session—Junior Assembly Room, Hotel President

COMMITTEE LUNCHEONS

Committee on Membership and Fellowship.

Committee on Meetings and Publications.

Committee on Professional Education.

Committee on Methods and Materials in Health Education.

Committee on School Health Service Practice.

Thursday, 12:30 P.M.

PROFESSIONAL EDUCATION

Special Luncheon—Congress Room, Hotel President

Address. EDWARD S. GODFREY, JR., M.D.

Address. PEARL McIVER, R.N.

Thursday, 2:00 P.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

General Session—Room 501, Auditorium

Thursday, 2:30 P.M.

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Third Session—Aztec Room, Hotel President

Reports of Committees.

International Coöperation in Vital Statistics. WILLIAM R. TRACEY.

Inauguration of Officers.

Thursday, 7:00 P.M.

SECOND GENERAL SESSION

Banquet—Arena, Auditorium

Presiding: ARTHUR T. McCORMACK, M.D., D.P.H., D.Sc., LL.D., President,
American Public Health Association.

Address of the President-elect. ABEL WOLMAN, DR.ENG.

Presentation of Forty Year Membership Certificate.

Announcement of Health Conservation Contest Awards.

Friday, 8:15 A.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

Breakfast Session—Tea Room. Hotel Muehlebach

Governing Council Meeting.

Friday, 9:30 A.M.

HEALTH OFFICERS

Third Session—Little Theatre, Auditorium

A Health Department Birth Control Program. J. W. ROY NORTON,
M.D., M.P.H.

SYMPOSIUM ON BUSINESS METHODS OF HEALTH DEPARTMENTS

The Essentials of Budgeting. WALTER N. KIRKMAN.

Cost Accounting. A. J. MESSIER.

Discussion. CLIFFORD C. SHORR and HENRY F. VAUGHAN, DR.P.H.

Friday, 9:30 A.M.

LABORATORY

Seventh Session—Room 201, Auditorium

Presiding: ROBERT S. BREED, PH.D.

MILK AND DAIRY PRODUCTS

Methods of Detecting Human Pathogenic Hemolytic Streptococci in Dairy Products. GEORGE J. HUCKER, PH.D.

The Place of the Methylene Blue Reduction and Resazurin Tests in a Milk Control Program. CYRIL K. JOHNS.

Mold Mycelium Fragments in Butter as an Index of the Quality of the Cream from Which the Butter Was Made. E. H. PARFITT, PH.D.

The New (Seventh Edition) Report on Standard Methods for the Examination of Dairy Products. ROBERT S. BREED, PH.D.

LABORATORY

Eighth Session—Room 501, Auditorium

Presiding: ELLIOTT S. ROBINSON, M.D., PH.D.

BIOLOGICAL PRODUCTS

The Preparation of Scarlet Fever Toxin. MARY E. EVANS and RUSSELL Y. GOTTSCHALL, PH.D.

A Precipitin Method for the Titration of Tetanus Toxin and Antitoxin. RAYMOND L. LIBBY and JOHN N. ADAM, JR.

The Preparation of Pneumococcus Diagnostic Sera. HENRY WELCH, PH.D.

Antipneumococcus Serum. HAROLD W. LYALL, PH.D.

Production of Antipneumococcic Rabbit Serum. B. SCOTT FRITZ.

Pneumococcus Diagnostic Serum. ELLIOTT S. ROBINSON, M.D., PH.D.

VITAL STATISTICS

Third Session—Room 400, Auditorium

Occupational Morbidity and Mortality. ROLLO H. BRITTEN and CLARK TIDBITTS.

Discussion. ROBERT J. VANE.

Population Growth—Its Vital Statistics and Public Health Aspects. WARREN S. THOMPSON, PH.D.

Tuberculosis.

a. A Study of Tuberculosis Mortality in Industrial Populations. C. C. DAUER, M.D., M.P.H.

b. A Method for Analysis of the Subsequent Course of Diagnosed Cases of Tuberculosis. RUTH R. PUTTER.

Discussion. GAUS E. HAEMON, M.D., and HERMAN E. HUNTER, M.D., C.P.H.

Friday, 9:30 A.M.

INDUSTRIAL HYGIENE

Third Session—Room 401, Auditorium

Time Lost by Industrial Workers from Disabling Sickness and Accidents During the Early Days of Disability. WILLIAM MCK. GAFATER.

Discussion. R. D. MUDD, M.D.

Asbestosis. R. R. SAYERS, M.D., and WALDEMAR C. DREESSEN, M.D.

Discussion. ANTHONY J. LANZA, M.D.

Compensation Insurance. THEODORE C. WATERS.

Discussion.

FOOD AND NUTRITION

Third Session—Room 500, Auditorium

Deterioration of Food During Distribution. (Report of the Committee on Foods.) *Chairman*, JULIAN H. TOULOUSE, PH.D.

Sanitary Condition of Containers for Retail Packages of Pasteurized Milk. J. RAYMOND SANBORN, PH.D.

Report on Procedures for Use in Investigating Food Poisoning Outbreaks. (Report of the Committee on Microbiological Examination of Foods.) *Chairman*, FRED W. TANNER, PH.D. (To be read by OSCAR B. WILLIAMS, PH.D.)

Status of Methods for the Microbiological Examination of Foods. FRED W. TANNER, PH.D.

Health Problems in Packaging Shellfish and Crustaceans. J. T. R. NICKERSON, PH.D.

CHILD HYGIENE AND PUBLIC HEALTH NURSING SECTIONS

Joint Session—Music Hall, Auditorium

Some Observations upon the Experience of the Victorian Order of Nurses for Canada with Cases of Pregnancy as Reflected by Case Records. J. T. PHAIR, M.B., D.P.H.

Newer Concepts and Procedures in Maternal Care. Speaker to be announced.

The Application of Public Health Nursing Procedures to the Newer Concepts of Maternal Care. ANNA R. MOORE, R.N.

Care of the Premature Baby. Speaker to be announced.

Friday, 9:30 A.M.

PUBLIC HEALTH EDUCATION

Third Session—Room 600, Auditorium

THE PART THE VOLUNTARY AGENCIES SHOULD PLAY IN ASSISTING
OFFICIAL LOCAL, STATE DEPARTMENTS OF HEALTH, AND
THE MEDICAL PROFESSION IN THE CONTROL OF DISEASE
AND THE CONSERVATION OF HEALTH—PARTICU-
LARLY THROUGH HEALTH EDUCATION
ACTIVITIES

Is the Local Private Health Agency on the Way Out? BLEECKER MAR-
QUETTE.

Is There a Place for the National Voluntary Health Agency, in View
of the New Public Health Activities of the Federal Government?
Speaker to be announced.

The Doctor Looks at the Voluntary Health Agency. PAUL A. TESCHNER,
M.D.

Discussion.

Friday, 10:00 A.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

General Session—Room 203, Auditorium

Friday, 12:15 P.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

Luncheon Session—Junior Assembly Room, Hotel President

Committee on Tuberculosis.

Editorial Staff.

Friday, 12:30 P.M.

PUBLIC HEALTH EDUCATION

Luncheon Session—Congress Room, Hotel President

SYMPOSIUM ON THE EDUCATIONAL AND PUBLICITY METHODS OF
THE RECENT NATION-WIDE CAMPAIGN TO STAMP OUT SYPHILIS

U. S. Public Health Service. PHILIP BROUGHTON.

American Social Hygiene Association. JEAN B. PENNEY.

Friday, 2:30 P.M.

ORAL HEALTH GROUP

Special Session—Little Theatre, Auditorium

Presiding: JOHN OPPIE McCALL, D.D.S.

Program to be announced.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Joint Session—Room 501, Auditorium

Presiding: ELLIOTT S. ROBINSON, M.D., PH.D.

THE USE OF BIOLOGICAL PRODUCTS

A Comparison of Mantoux Tests Done with Old Tuberculin and with P.P.D. M. H. BROWN, M.D.

Comparison of Freshly Diluted Old Tuberculin with the Same Tuberculin in a Buffered Stabilizing Diluent. ARTHUR W. NEWITT, M.D.

A Comparison between Convalescent Serum and Scarlet Fever Antitoxin in the Treatment of Scarlet Fever. FRANKLIN H. TOP, M.D.

Futility of Skin Testing as a Means of Establishing an Epidemiological Index of Tuberculous Infection. LESLIE L. LUMSDEN, M.D., W. PALMER DEARING, M.D., and R. ALEX BROWN, M.D.

LABORATORY, PUBLIC HEALTH ENGINEERING, AND FOOD AND NUTRITION SECTIONS

Joint Session—Music Hall, Auditorium

Presiding: ROBERT S. BREEO, PH.D., BERNARD E. PROCTOR, PH.D., and JOEL I. CONNOLLY.

SYMPOSIUM ON THE PHOSPHATASE TEST IN THE CONTROL OF MILK PASTEURIZATION

Status of Pasteurization of Milk and Milk Products. (Report of the Committee on Milk and Milk Products.) *Chairman,* MERRILL J. MACK.
(To be read by J. A. KEENAN, M.D., PH.D.)

A Modified Field Technic for the Phosphatase Test. HARRY SCHARER.

Further Studies on the Value of Phosphatase as an Indicator of Pasteurization. F. WELLINGTON GILCREAS and W. S. DAVIS.

Comparative Study of Field and Laboratory Methods for Phosphatase Test. WALTER VON D. TIEDEMAN, M.C.E., and WADE F. ALEXANDER.

Experiences in the Use of the Phosphatase Test in the Control of Pasteurization. PAUL F. KRUEGER.

Application of the Phosphatase Test to Creamery Butter. G. W. SHADWICK, JR., and MILTON E. PARKER.

Friday, 2:30 P.M.

INDUSTRIAL HYGIENE AND PUBLIC HEALTH
NURSING SECTIONS

Joint Session—Room 600, Auditorium

Practical Methods for the Control of Hygienic Exposures. C. A.
COBURN.

Discussion.

Industrial Medical Department Organization. JOHN J. PRENDERGAST,
M.D.

Discussion.

Industry's Challenge to the Nurse. LAVONA BABB, R.N.

Discussion.

Friday, 4:00 P.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

Governing Council Meeting—Room 201, Auditorium

Election of Officers.

MEETINGS OF OTHER ORGANIZATIONS

AMERICAN ASSOCIATION OF STATE REGISTRATION EXECUTIVES

Tuesday, 2:30 P.M. Aztec Room, Hotel President. (See page 970.)

Tuesday, 6:30 P.M. Dinner. Junior Assembly Room, Hotel President.

Wednesday, 9:30 A.M. Junior Assembly Room, Hotel President. (See page 972.)

Wednesday, 2:30 P.M. Joint Session with Vital Statistics Section. Junior Assembly Room, Hotel President. (See page 974.)

Thursday, 2:30 P.M. Aztec Room, Hotel President. (See page 980.)

AMERICAN SCHOOL HEALTH ASSOCIATION

Monday, 4:00 P.M. Room 501, Auditorium.

Monday, 8:00 P.M. Trianon Cafe, Hotel Muehlebach.

Tuesday, 9:30 A.M. Joint Session with Public Health Nursing Section. Little Theatre, Auditorium. (See page 967.)

Thursday, 9:30 A.M. Joint Session with Child Hygiene Section. Little Theatre, Auditorium. (See page 979.)

Thursday 12:15 P.M. Committee Luncheons. Junior Assembly Room, Hotel President. (See page 979.)

Thursday, 2:00 P.M. Room 501, Auditorium. (See page 979.)

Friday, 8:15 A.M. Governing Council Breakfast. Tea Room, Hotel Muehlebach. (See page 980.)

Friday, 10:00 A.M. Room 203, Auditorium. (See page 983.)

Friday, 12:15 P.M. Committee on Tuberculosis, Editorial Staff Luncheon. Junior Assembly Room, Auditorium. (See page 983.)

Friday, 4:00 P.M. Room 201, Auditorium. (See page 985.)

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Sunday and Monday, October 23 and 24. Seventeenth Annual Conference, Excelsior Springs, Mo.

Monday, 6:30 P.M. Dinner. Banquet Hall, Hotel Muehlebach.

AMEROPS

Thursday, 8:00 A.M. Breakfast. Music Room, Hotel Muehlebach.

CONFERENCE OF STATE LABORATORY DIRECTORS

Monday, 9:30 A.M. Room 400, Auditorium.

Monday, 12:30 P.M. Luncheon, Aztec Room, Hotel President.

Monday, 2:30 P.M. Room 400, Auditorium.

CONFERENCE OF STATE SANITARY ENGINEERS

Monday, 9:30 A.M. Room 500, Auditorium.

Monday, 2:30 P.M. Room 500, Auditorium.

Tuesday, 2:30 P.M. Joint Session with Public Health Engineering Section.
Little Theatre, Auditorium. (See page 968.)

Wednesday, 6:30 P.M. Annual Engineers' Stag Dinner. Banquet Hall, Hotel
Muehlebach. (See page 976.)

DELTA OMEGA

Tuesday, 12:30 P.M. Luncheon. Junior Assembly Room, Hotel President.

HARVARD UNIVERSITY ALUMNI

Thursday, 8:00 A.M. Breakfast. Trianon Cafe, Hotel Muehlebach.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

Monday, 9:30 A.M. Room 401, Auditorium.

Monday, 12:30 P.M. Luncheon. Junior Assembly Room, Hotel President.

Monday, 2:30 P.M. Room 401, Auditorium.

Monday, 6:30 P.M. Dinner. Tea Room, Hotel Muehlebach.

JOHNS HOPKINS UNIVERSITY ALUMNI

Wednesday, 8:00 A.M. Breakfast. Trianon Cafe, Hotel Muehlebach.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY ALUMNI

Wednesday, 8:00 A.M. Breakfast. Tea Room, Hotel Muehlebach.

YALE UNIVERSITY ALUMNI

Thursday, 8:00 A.M. Breakfast. Tea Room, Hotel Muehlebach.

RAILROAD FARES FROM VARIOUS POINTS TO KANSAS CITY, MO.

AMERICAN PUBLIC HEALTH ASSOCIATION
OCTOBER 25-28, 1938

<i>From</i>	<i>One-way Pullman Travel</i>	<i>Round-trip for Pullman Travel</i>	<i>One-way Lower</i>	<i>One-way Upper</i>
Atlanta, Ga.	\$27.15	\$36.20 *	\$6.00	\$4.80
Baltimore, Md.	35.50	67.00	8.00	6.40
Boston, Mass.	44.35	82.00	9.75	7.80
Buffalo, N. Y.	29.50	52.30	6.75	5.40
Chicago, Ill.	13.78	20.70	3.00	2.40
Cincinnati, Ohio	18.71	30.70 *	4.25	3.40
Cleveland, Ohio	24.00	41.20	5.50	4.40
Dallas, Tex.	14.85	22.30	4.25	3.40
Denver, Colo.	18.96	28.45	4.25	3.40
Detroit, Mich.	22.33	37.80	5.00	4.00
Duluth, Minn.	18.94	28.45	5.50	4.40
Fort Worth, Tex.	14.85	22.30	4.25	3.40
Indianapolis, Ind.	15.80	27.45	3.75	3.00
Jacksonville, Fla.	35.17	46.90 *	8.50	6.80
Louisville, Ky.	16.86	25.30 *	4.25	3.40
Los Angeles, Calif.	52.75	75.60	13.25	10.60
Memphis, Tenn.	14.70	22.05	3.00	2.40
Milwaukee, Wis.	15.55	23.35	3.25	2.60
Minneapolis, Minn.	14.69	22.05	3.75	3.00
Nashville, Tenn.	18.47	25.20 *	5.00	4.00
New Orleans, La.	26.53	39.80	6.00	4.80
New York, N. Y.	40.10	75.20	9.00	7.20
Omaha, Nebr.	5.97	9.00	2.50	2.00
Philadelphia, Pa.	37.40	69.80	8.50	6.80
Pittsburgh, Pa.	26.90	48.90	6.00	4.80
Portland, Ore.	58.03	75.60	13.25	10.60
Salt Lake City, Utah	34.57	51.90	8.50	6.80
San Francisco, Calif.	52.75	75.60	13.25	10.60
Seattle, Wash.	58.81	80.25	13.25	10.60
St. Louis, Mo.	8.36	12.55	2.50	2.00
Washington, D. C.	35.50	67.00	8.00	6.40
Montreal, Que.	40.98	75.10	8.75	7.00
Halifax, N. S.	58.83	110.80 (Approx.)	13.50	10.80
Ottawa, Ont.	37.98	69.10	8.50	6.80
Quebec, P. Q.	46.63	86.40	11.00	8.80
Toronto, Ont.	29.58	52.30	6.75	4.60
Vancouver, B. C.	58.81	80.25	13.25	10.60

* Denotes 15 day limit; other fares for tickets with 30 day limit.

KANSAS CITY ANNUAL MEETING

TO public health workers in Kansas City, October 25-29 are "red letter days" on the fall calendar. When Mr. and Mrs. Delegate pack their bags for the 67th annual meeting of the American Public Health Association, they should come prepared for sports, sight-seeing, and a wealth of scientific information. As chief host, Kansas City's Health Director, Dr. E. H. Schorer, has arranged a varied entertainment program. From a professional standpoint, 8 optional tours have been arranged, to give not only a composite picture of Kansas City's health program, but also an opportunity to see something of the city itself.

Scientific sessions on Tuesday and Wednesday evenings, October 25 and 26, will be held in the colorful Music Hall of the Kansas City Municipal Auditorium. The business session will be followed by dancing in the Little Theatre. Guest speakers for the public meeting on Wednesday evening, October 26, will be President Arthur T. McCormack, Health Commissioner of Louisville, Ky., and Dr. E. V. McCollum, Professor of Bio-chemistry at Johns Hopkins University, Baltimore, Md.

The Annual Banquet of the Association will be held on Thursday, October 27, in the vast main arena of the Auditorium. Entertainment will include various tribal dances by students from Haskell Institute, a federal training school for Indians at Lawrence, Kans.; music by a Negro choir of 500 members; and a 12 minute demonstration of color lighting from the huge

dome ceiling of the Arena, where all of the various lighting effects obtainable in a modern theatre may be produced.

Between business sessions, banquets, luncheons, and other entertainment features, golf enthusiasts will be extended the courtesy of the sportiest of Kansas City's private courses. Ample time will be allowed for individual entertainment and for inspection of Kansas City itself. The 8 optional tours, as arranged by Chairman E. L. Filby, have been planned with this thought in mind, and with the thought that public health as affected by the manufacture of food products, meat inspection, the municipal water supply, and model dairy farms, may be studied at first hand. As outlined below, each of the tours includes at least one industrial or food plant, municipal water departments, or hospitals, closing with a tour of Kansas City's William Rockhill Nelson Gallery of Art, and the well known Country Club residential section.

Trip 1—Loose Wiles Biscuit Company, Armour Packing Plant, a tour of the Central Industrial Area, Country Club Residential Section, Nelson-Atkins Gallery of Art, and the Municipal Hospital group.

Trip 2—Swift Packing Plant, Southwest Milling Company, through Country Club Plaza and residential section, to Nelson-Atkins Gallery of Art, and Municipal Hospital group.

Trip 3—Cudahy or Wilson Packing Plants, west to Colgate Palmolive Peet Soap Manufacturing plant, through central industrial area, returning to Country Club Plaza and residential section, Nelson-Atkins Gallery of Art, and Municipal Hospital group.

Trip 4—To Municipal hospitals, and Union Station Plaza, with stops at the Liberty



Entrance to Longview Farm

Memorial, a combined monument and building erected in 1926 in honor of Kansas City's World War dead; south over the winding drives of Kansas City's Country Club Plaza and residential sections; returning by way of Nelson-Atkins Gallery of Art, University of Kansas City, Kansas City Art Institute, and Rockhill residential section, to Children's Mercy Hospital for inspection tour.

Trip 5—To Larrabee Flour Mills, and Municipal Waterworks in Missouri and Kansas, returning by way of Fairfax and Municipal Airports to hotel headquarters. The Kansas City, Mo., water purification works is a modern 100,000,000 gallon per day purification plant. The raw water which is taken from the Missouri River carries a large amount of suspended matter, and at times as much as 619 tons of suspended matter is removed per hour at this plant. The purification process consists of pre-sedimentation, coagulation, chlorination, and filtration.

Trip 6—For those who register in advance, a 40 mile trip to Leavenworth, Kans., site of Federal Narcotics Bureau, Federal Penitentiary, and Old Soldier's Home. Within the walls of the federal prison, 3,103

men are gainfully employed in one of the various units which include an engine room, barber shop, broom factory, carpenter shop, shoe factory, tailor shop, hospital, and two farms. Of these, the engine room, barber shop, hospital, tailor shop, and farms are operated solely for the use of prisoners. Industries featured at the prison are the carpenter shop, broom shop, and shoe factory, finished products of which are sent to other federal bureaus to supply the Army and Navy, federal training schools for Indians, and other federal prisons.

Trip 7—Tuberculosis Hospital at Leeds, 10 miles out of Kansas City.

Trip 8—For those who register in advance, a 10 mile trip to Longview Farm, a 1,700 acre colony, with its own 20 acre lake, private water supply, chapel, modern dairy, greenhouses, and fine horses. It is operated by Mrs. Lula Long Combs, daughter of the late R. A. Long, who, while building a vast lumber kingdom, became interested in breeding fine horses. Interesting to visitors is Mrs. Combs's array of ancient hacks and rigs, complete with "driving apparel" from the Gay Nineties to the present day.

Longview's modern dairy contains 525 Guernseys, Holsteins, and Jersey cattle, which



Kansas City Tuberculosis Hospital

provide milk which is bottled and moved on conveyer belts to waiting dairy trucks. The greenhouse contains 35,000 roses and 25,000 gardenias, as well as a few orchids, carnations, and other cut flowers which are sold to wholesale florists. Of the 1,700 acres acquired in 1911-1912, approximately 100 acres are landscaped, 1,200 in cultivation devoted to raising of feed, and the remainder in pastures.

Second only to interest in convention activities and opportunities for recreation is a professional interest in the general health program being carried on in the host city.

Public health in Kansas City is both tax supported and voluntary, the latter being carried on through the health division of the Council of Social Agencies. The former is that which is done through the Board of Education, and the City Health Department.

The City Health Department, under the direction of Dr. E. H. Schorer, in addition to the divisions ordinarily

found in a health department, includes a division of hospitals. These are the municipal General Hospital for the white, the General Hospital for the colored, and the tuberculosis and isolation hospitals for the white and colored. The staffs of the general hospitals are voluntary, and only members of the Jackson County Medical Society at the white hospital, and the Kansas City Medical Society for the colored are eligible. As 10 per cent of Kansas City's population is Negro, the general hospital for colored has a definite place in the local health program. Fifty per cent of the Negro children born in Kansas City in 1937 were born here.

The Tuberculosis Hospital at Leeds, Mo., is one of the few municipal hospitals in the United States for the treatment of tuberculosis. Patients are admitted through the tuberculosis service in cooperation with the Kansas

City Tuberculosis Society, and surgical treatment is given cases transferred from the state and county sanatorium. It has a modern surgical pavilion, completed within the last 2 years, where such operations as phrenicectomy, thoracoplasty, and pneumolysis are most frequently performed. The hospital's combined plant has been checked by many of the country's foremost phthisiologists and proclaimed a complete and modern working unit for the treatment of all types of pulmonary tuberculosis.

Out-patient departments are maintained at both of the General Hospitals, including a social service department, which coöperates with the Council of Social Agencies. All patients, except some at the Tuberculosis Hospital, are registered at the Central Index of Indigency.

Health work in the schools is under the Department of Health and Physical Education. Besides the health instruction given in the classrooms as part of the school curriculum, and the home care by the school nursing staff, special schools and classes are provided for under-privileged, physically handicapped children. There are 15 schools which have open air rooms for children who are contacts with tuberculosis, or who are predisposed to tuberculosis, or, in special cases, children with heart trouble or who are undernourished. There are also a trachoma school, a school for the deaf, a sight saving class in one of the schools, and a school for crippled children.

Diphtheria immunization during the past 4 years has been largely under the control of the medical profession of Kansas City, the Health Department supplying the immunization material. As a result of diligent effort, there were no deaths from diphtheria in 1936 and 1937, and the number of cases per year has been so markedly decreased

that only 63 cases were reported last year in a population of 425,000.

The Council of Social Agencies brings together the various volunteer health agencies in Kansas City. The City Health Department and the Jackson County Medical Society also have representation on this Council. In addition to providing educational programs, this division also has special committees to study health needs of the community, with an eye to possible elimination of duplication or unnecessary services. Under this council are the health agencies supported wholly or partially by the Allied Charities Fund through voluntary contributions, the Red Cross, the Health Conservation Association, the Children's Bureau, Visiting Nurse Association, and the various hospitals, clinics, and health centers.

The Health Conservation Association is composed of a federation of volunteer health educational organizations. Component agencies include the Tuberculosis Society, Mental Hygiene Society, Cancer Control Committee, Child Guidance Clinic, Social Hygiene Society, Heart Committee, Dental Hygiene Committee, the Milk Committee, and the Pneumonia Committee. All of these organizations are housed in one central office for administrative purposes, and each carries on its own work, in addition to contributing to the joint health program of the association. Integration of programs and policies is provided by a board of directors, made up of 3 representatives from each component agency, together with 10 directors representing the public.

The Children's Bureau conducts an annual health canvass, with the aid of several hundred volunteers. Last year, 8,599 preschool children were examined at various centers located in public school buildings. Of this num-

ber, 5,156 were found to have defects needing attention, and the parents were referred to their physicians. Year round health educational work is done through special health institutes and group meetings. The Children's Bureau works in close coöperation with the City Health Department, the Jackson County Medical, and the Kansas City Dental Societies.

The Visiting Nurse Association, with its staff of 42 nurses, provides skilled nursing care to patients in their own homes, and endeavors to meet the needs of those who do not find it possible to employ a full-time nurse in the home. The full cost of a nursing visit is \$1.00 (maternity \$1.25), and the nurse is expected to collect as much of this sum as possible. Part pay service is available for those patients who wish to pay something, but who cannot pay the full cost of this service, and free health services are given to those unable to pay, made possible by the allotment received from the Charities

Fund. The services available include general nursing, maternity nursing (prenatal and postnatal care), communicable disease nursing, tuberculosis nursing, child welfare service, and infantile paralysis service. This last consists of muscle training and massage, given in the patient's home, at the R. J. Delano School for crippled children, and at the Attucks School for Negro children. The association also supplies nursing service to 15 affiliated organizations. Last year the nurses made 98,494 visits to 18,717 patients, each nurse averaging 8.7 visits per day.

The Wheatley-Provident Hospital is one of 16 hospitals having an "A" rating among Negro hospitals accredited by the American College of Surgeons. It is also the only approved hospital to which moderately large sums have been given, that is owned, operated, and staffed by Negroes, and the only hospital in Greater Kansas City having accommodations for colored pay patients in private or semi-private rooms,



Lake at Longview Farm—10 miles outside Kansas City



Kersey Coates Drive, Kansas City

as well as wards. It maintains a children's ward for Negro children, similar to Children's Mercy Hospital. Last year the in-patient department cared for 463 adults and 125 children, while the clinic served 3,194 different individuals.

Children's Mercy Hospital is one of Kansas City's beloved institutions, and its name is synonymous with that of the late Dr. Katherine B. Richardson. It was founded more than 40 years ago for sick and crippled children whose families cannot afford to pay for hospital care. Last year the hospital cared for 2,344 different children, or an average of 195 per month, in the in-patient department; while in the out-patient department, 15,528 different children made 22,006 visits to the clinic, or an average of 1,571 visits per month.

Clinics and Dispensaries—People who cannot afford the paid services of physicians when sick or injured, may

be treated in one of the several private clinics, maintained in part or entirely by allotments from the Kansas City Charities Fund. Altogether last year these clinics (exclusive of Children's Mercy Hospital and the Wheatley-Provident Hospital clinics) served 19,909 individuals for 62,857 visits. While a small fee may be charged for registration or drugs, no patient is turned away for lack of funds; on the other hand, proper investigation is made to prevent imposition. Many physicians and dentists give generously of their time both in the clinics and the hospitals.

Of these clinics, the Alfred Benjamin Dispensary and the West Side Health Center, or Richard Cabot Club will be mentioned. The Alfred Benjamin Dispensary is perhaps one of the best equipped charitable institutions in the country. It also houses the child guidance clinic of the Mental Hygiene Society.

The West Side Health Center is located on the once fashionable "Quality Hill," now more appropriately known as "Quantity Hill." It is a general health clinic.

The University of Kansas Hospital, located in Kansas City, will be of interest to public health workers because of the out-patient department, which serves patients on either side of the state line, the attendance exceeding 70,000 visits annually. The hospital has a bed capacity of 250 beds, and is owned and controlled by the Medical School. Eighty-five per cent of the beds are available for teaching purposes, in spite of the fact that the hospital is 80 per cent self supporting.

The hospital is located 2 miles southwest of the Municipal Auditorium, at 39th Street and Hudson Road, occupying a new site on the Kansas side of this metropolitan area. The newly developed medical plant is situated atop a hill, occupying 15 acres of

land, including a group of 4 new buildings of modern construction: the hospital, the nurses home, the medical school, and the power plant. Recently completed are the children's pavilion, the new clinic building or out-patient building, and the Hixon laboratory devoted exclusively to research. The first 1½ years of the medical course are given at the University of Kansas at Lawrence, Kans., 40 miles west of here, where the departments of anatomy, physiology, bio-chemistry, and bacteriology are located. The last 2½ years are given in the Kansas City division of the medical school.

The foregoing is not intended to be comprehensive as regards public health work in Kansas City. Neither can it be said to do justice to Kansas City's many attractive features for amusement to visitors. Delegates will find Kansas Citians eager to make this meeting a most successful and pleasurable one for all who attend.

APPLICATION FOR HOTEL ACCOMMODATIONS

This application is reprinted for your convenience in making hotel reservations. The Hotels Muehlebach, President, and Kansas Citian are headquarters. Mail application to the address below and not to the hotel of your choice.

In making application for hotel accommodations, it is necessary that four choices of hotels be indicated and that a reasonable range of rates desired be shown. Whenever possible, arrangements should be made for occupancy of double rooms; only a limited number of single rooms are available.

HOUSING COMMITTEE
1028 Baltimore Avenue
Kansas City, Missouri

Date.....

Please make hotel reservations noted below:

Hotel First Choice

Hotel Third Choice

Hotel Second Choice

Hotel Fourth Choice

...Double Rooms with bath for persons.Rate desired \$... to \$... per day

...Single Rooms with bath.....Rate desired \$... to \$... per day

...Suites—Parlor, ...Bedroom(s) with bath for ... persons. Rate desired \$... to \$... per day

Special Instructions

.....

.....

Arriving, hourA.M.P.M. Leaving

If the hotel of first choice is unable to accept the reservation, the HOUSING COMMITTEE will endeavor to comply with your second, third or fourth choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

NAME	STREET ADDRESS	CITY	STATE
.....
.....
.....

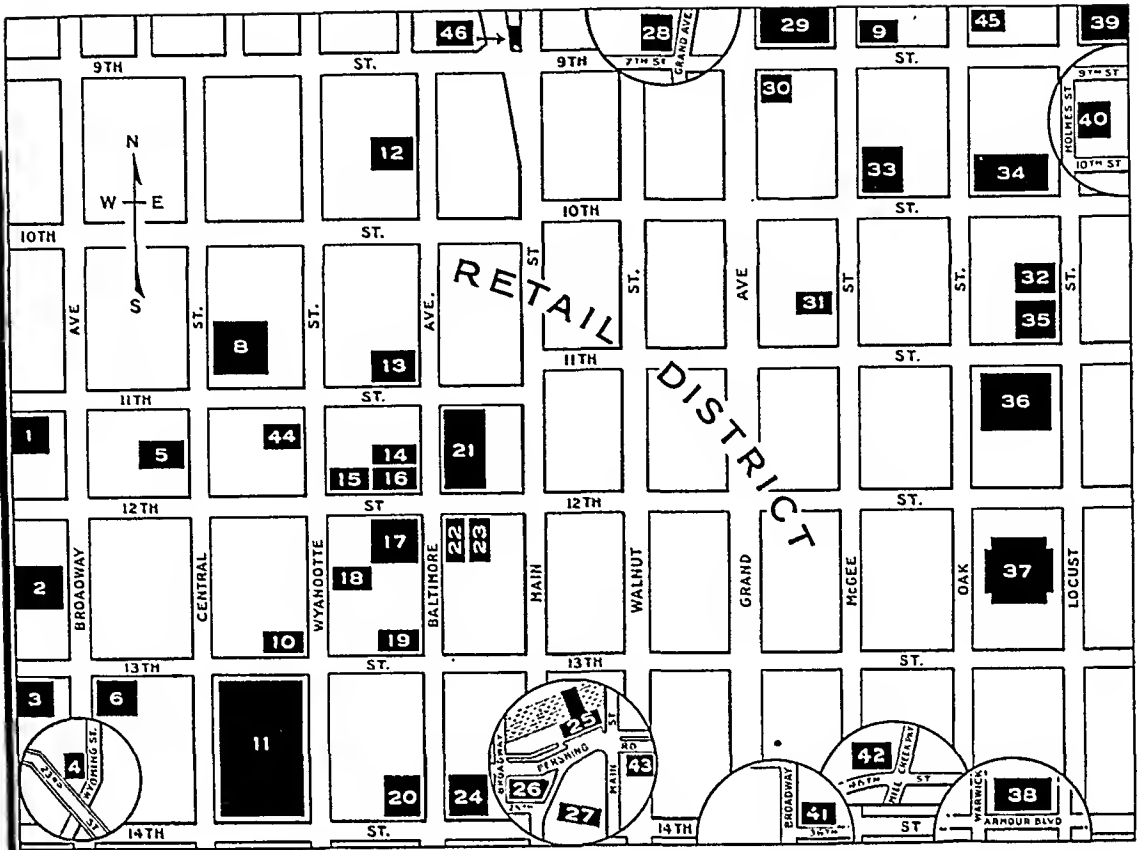
(Please attach sheet listing additional names if necessary)

Name

Firm Name

Mailing Address

City State



HOTELS—(All Rates Quoted are for Rooms with Bath)

Map No.	Hotel	Address	Rates	
			Single	Double
18	Aladdin	1213 Wyandotte	\$2.00-\$2.50	\$3.00-\$5.00
21	Baltimore	12th and Baltimore	\$2.00-\$3.50	\$3.00-\$6.00
38	Bellerive	214 East Armour	\$2.50-\$4.00	\$4.00-\$5.00
14	Bray	1114 Baltimore	\$1.50-\$2.50	\$2.50-\$3.50
40	Chase	911 Holmes	\$1.50	\$2.50
2	Commonwealth	12th and Broadway	\$2.00-\$3.00	\$3.00-\$5.00
22	Dixon	12th and Baltimore	\$2.00-\$3.50	\$3.50-\$5.00
32	Drake	1016 Locust	\$1.50	\$2.50
41	Hyde Park	36th and Broadway	\$3.00-\$7.00	\$3.50-\$10.00
13	Kansas Citian	11th and Baltimore	\$2.50-\$4.00	\$3.50-\$7.00
17	Muehlebach	12th and Baltimore	\$3.00-\$6.00	\$4.50-\$8.00
42	Park Lane (Apartments)	4600 Mill Creek Parkway	\$3.00-\$5.00	\$4.00-\$7.00
16	Phillips	12th and Baltimore	\$2.50-\$4.00	\$4.00-\$6.00
33	Pickwick	10th and McGee	\$2.50-\$4.00	\$3.50-\$5.00
43	Plaza	13 East 24th	\$1.50-\$2.50	\$2.50-\$3.50
24	President	14th and Baltimore	\$2.50-\$5.50	\$3.50-\$8.00
44	Rasbach	1116 Wyandotte	\$1.50-\$2.50	\$2.50-\$3.50
10	Robert E. Lee	13th and Wyandotte	\$1.75-\$2.50	\$2.75-\$3.50
23	Sexton	15 West 12th	\$2.00-\$2.50	\$3.00-\$5.00
45	Snyderhof	917 Oak	\$1.50-\$2.50	\$2.00-\$4.00
15	Stats	12th and Wyandotte	\$2.00-\$3.50	\$3.00-\$6.00
9	Victoria	9th and McGee	\$1.50	\$2.00
46	Westgate	Main and Delaware at 9th	\$1.50-\$2.00	\$2.00-\$3.00

HALLS

Map No.	Hall	Address
11	Municipal Auditorium	13th to 14th, Wyandotte to Central
4	American Royal Building	23rd and Wyoming
8	Ararat Temple	11th and Central
20	Edison Hall	1330 Baltimore

PUBLIC BUILDINGS

Map No.	Building	Address
36	City Hall	414 East 12th
13	Convention Bureau, Chamber of Commerce	1028 Baltimore
37	Court House	415 East 12th
29	Federal Building	815 Grand
20	K. C. Power and Light Building	1330 Baltimore
27	Liberty Memorial	Union Station Plaza
26	Post Office	315 West Pershing Road
39	Public Library	506 East 9th
25	Union Station	30 Union Station Plaza

CLUBS

Map No.	Club	Address
5	Eagles Club	1108 Central
28	Elks Club	120 East 7th
13	Kansas City Athletic Club	11th and Baltimore
19	Kansas City Club	13th and Baltimore
12	University Club	918 Baltimore
34	Y.M.C.A.	10th and Oak
31	Y.W.C.A.	1020 McGee

CHURCHES

Map No.	Church	Address
1	Cathedral	411 West 11th
35	First Christian Church	11th and Locust
3	Grace and Holy Trinity (Episcopal)	415 West 13th
30	Grand Avenue Temple (Methodist)	9th and Grand
6	West Side Branch Baptist	1301 Broadway

PUBLIC HEALTH EDUCATION*

Consultation at Kansas City—
Please make yourself known at the desk in Health Education and Publicity Headquarters.

Kindly come prepared to share your ideas and your experiences. And come loaded with questions and problems.

The editor of this department invites discussion with all concerned with health education. Workers with long experience will welcome opportunities for answering questions.

Free Material for Kansas City—
Please do not send to New York free material intended for distribution at Kansas City in October.

Kindly ask for the correct mailing or shipping address.

Wanted! If Announced in Advance!—We want for display at Kansas City in October materials on public health education, college or school health education.

Descriptions, outlines, or reports of health education done by departments or associations, colleges, schools.

Topics, outlines, and full copies of talks, or various forms of broadcasts will find interested readers.

Photographs or drawings, posters or placards, projection material, dramatizations, 3 dimension exhibits, window displays—all will be given adequate space.

Much of the above could be mounted on large cards, or in portfolios or scrapbooks.

Please be sure to report long in advance for assignment of space and for specific shipping or delivery instructions.

Correct addressing and deliveries will do away with many troubles behind the scenes.

Two Copies for Kansas City—
Please send 2 copies each of whatever you have, printed or mimeographed, to be included with other classified materials for display at Kansas City in October.

Address to the editor. See footnote on the first page of this department.

Roll Posters for the Receivers—
Did you ever receive a poster in a roll, and try to flatten it for wall display? And have you rolled and rolled, and not always succeeded in making the top and bottom rest against the wall?

And while you are struggling with that poster did you wonder about the people who put out posters and fail to visualize the troubles they inflict upon the innocent receivers?

Are You Interested in Meetings?
In Discussion?—Gatherings of 3 to 30, to 300 or even more, are among the chief channels for health education. Conferences or committee meetings almost lead as a method in planning and organizing public health activities.

There are ways leading to better meetings of all types. Discussion in committees and elsewhere can be satisfying and fruitful. We are working on meeting practices and discussion techniques. Please tell us about your experiences and observations. Your help will be appreciated.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to
Ewart G. Routzahn, 130 East 22d St., New York, N. Y.



MATERNITY CENTER POSTERS

Maternity Care Made Graphic— Effective examples of poster production by the silk screen process are offered by the Maternity Center Assn., 1 E. 57th St., New York, N. Y. Set of 5, 50 cents. Each of the set, illustrated on this page, is 8 by 24 inches; 3 are white on blue, 2 are white on red.

The instructions say:

These posters are designed for use in maternity clinics, mothers' classes, health centers, nursing associations, community exhibits, etc. Their purpose is to teach expectant mothers and fathers important points of maternity care in a clear and simple manner.

They should be hung at eye level about 4 inches apart. If the color of the wall on which they are placed detracts from their value, they may be hung against a sheet of white paper, approximately 10 feet long and 40 inches wide. White wrapping paper, crepe paper, or corrugated paper looks well.

Journal for June, 1938—References in *American Journal of Public Health*, June, 1938:

"Medical Writing" (p. 705) emphasizes a condition and suggests a remedy.

"Nutrition Program in a State Health Department," by Morris (pp. 718-722) describes a school year in a Delaware county:

"what we did, then how we did it, and finally why we did it."

Be sure to read "An American Museum of Health" (pp. 771-773).

"Newer Knowledge of Poliomyelitis" (p. 776) is a quotation of

especial importance to all who deal with public opinion.

In "Books and Reports" see "How To Be a Convincing Talker" (p. 784), and "How To Use Pictorial Statistics" (p. 785).

See several paragraphs in "A Selected Public Health Bibliography" (pp. 792-794).

"Health Conservation Contests," (pp. 795-796) lists the 1937 winners.

"Health Education" is a subdivision under "Positions Wanted" (p. 799).

Note "Physical Education Associations Merge" (p. 801).

Why Not Use Colored Paper?—

This question is posed in "Advantages of Colored Paper," by H. Falls, in *Direct Advertising*, Boston, Mass.

"Why not write or print your message on a rich, warm, appealing shade that will attract women, instead of trying to tell your story on prosaic white paper which is in itself cold, commonplace, and impersonal?"

There is no doubt that color has a very definite influence on people. Instead of trying to get all the color into your advertising message with the use of colored inks, let the paper itself do part of the job. . . .

Why the Addresses?—So far as is practicable we give addresses from which originate whatever is mentioned in this department of the *Journal*.

This is done to facilitate correspondence direct from any interested reader. When we know the cost it is indicated.

When you send the editor a report, a pamphlet, or anything else, you would reduce the wear and tear by stating that you have some extra copies if health workers ask for them (or that you have no extra copies). If there is a price, please tell us. If 3 cents postage, or 5 cents, or more should accompany the request, please say so.

The editor does not supply the material mentioned in these pages.

"We Don't Have Time"—To prepare good health education material. That is the situation of hundreds of over-busy health officers.

One way out is to make use of what some one else has prepared.

We are delighted to see in bulletins good material quoted from other sources. And here come two examples of other uses made of material appearing in *Health News*, New York State Dept. of Health, as reported July 26, 1937:

Two city health officers, Dr. D. V. O'Leary, of Albany, and Dr. H. J. Shelley, of Middletown, recently made effective use of *Health News* items by having reprints made and distributed locally.

Dr. O'Leary distributed to several hundred local restaurants and other public eating places reprints of the "'Doctor Jones' says—" item of June 14 in which "Doctor Jones" told of seeing a restaurant worker "lick off" her fingers before and after handling food and commented on the dangers involved in this practice.

Dr. Shelley reprinted in parallel columns two items from the issue of June 28: one referring to an outbreak of scarlet fever traced to raw milk which was being sold without a permit; the other, to an award of damages against a milk dealer and producer in connection with a case of undulant fever in which the infection apparently was conveyed through milk. Dr. Shelley distributed the reprints to local milk dealers and producers.

Our disappointment is that Dr. O'Leary and Dr. Shelley did not send us samples long ago.

When the Scientist Is a Writer—Under "Publications" in the 1937 annual report of the Commonwealth Fund (41 E. 57th St., New York, N. Y.) is this paragraph:

Scientific writing in the United States is not distinguished for simplicity or grace, and much of the work in which the Fund is interested has been done in fields where concepts are still shadowy and terminology undisciplined. Moreover clarity means one thing to the scientific reader—who asks only an orderly sequence of declarative sentences built from a precise and highly specialized vocabulary—and another to the layman, who deplores "jargon," responds to simple prose rhythms, and usually needs analogy and metaphor as a bridge to unfamiliar ideas. Since the Fund serves now one audience, now another, and deals often with technical experts who are inexperienced in authorship, it requires care and flexibility in editing to make sure that each publication is in the form which will make it most useful.

The report calls attention to an important aspect of foundation publication activities:

Many of its publications fulfil their aim with sales which are numerically insignificant but which reach key people who make effective use of the books they buy . . .

On the other hand a foundation, seeking educational rather than cash returns, is in position to issue publications of value which might not interest a commercial publisher, and sometimes the results are surprising. When *The Problem Child in School* was just off the press, in 1925, a reader for a commercial publishing house estimated that in the trade total sales of 300 might be expected for it. The Fund has sold to date more than 17,000 copies. This happens rarely. But on many occasions in the last ten years there has been evidence that the books published by the Fund have been inherently useful and actually used.

"One Third of a Nation"—Under this title the WPA Federal Theater in New York City presents another "edition" of its "Living Newspaper." According to *Cue*:

"This is the biggest and most thorough of the Federal Theater's lantern slide and lecture investigations of various phases of the

nation's industry, habits, and practices. It takes the history of the housing problem in New York City for its theme, and traces it from the old colonial land grant days to the nirvana of Federal housing."

"It is a vigorous, well written, and emphatic platform-play true in every detail and with an enormous impact . . .

"It is a little shocking to be reminded that houses still exist where the law calls for only one water tap and one toilet per floor, and where central heating is one of the major mysteries. The play is a monument of ingenuity in staging, research, and in assembling, and editing, the latter done by the increasingly skillful Arthur Arent . . ."

"As a matter of fact, there is not much acting in the usual sense. In those scenes depicting the cholera plagues and in other vignettes of human misery, some neat little characterizations were accomplished briefly and to the point . . ."

"The work is hereby earnestly recommended, not only to social workers and

those interested in a further government participation in low cost housing, but to students of stage mechanics, scene designers, and people generally interested in the theatre . . ."

WANTED

A request from Hedurg B. Poehler, instructor in nutrition, Health Dept., Milwaukee, Wis., is a reminder of how little nutrition material has come in from all the health agencies of the country. Please reply direct to this inquiry:

"I would like to collect nutritional material for an exhibit at the convention of the American Dietetic Association to be held in Milwaukee this fall. Can you tell me which public health organizations, local and state boards of health, have exceptionally good pamphlets, posters, devices, etc., for teaching nutrition?"

BOOKS AND REPORTS

Manual for Water Works Operators—*Prepared by the Manual Committee, Texas Water Works Short School. Edited by E. W. Steel. Austin, Tex.: Texas State Department of Health, 1938. 278 pp. Price, \$2.00.*

In 1933 the Texas Water Works Short School for water works operators and superintendents took a forward step in emphasizing the importance of employing trained personnel in the operation of public water supplies by initiating a system of voluntary licensing of water works personnel.

Three grades of licenses are issued, based on factors that reflect the experience, training qualifications, and ability of the applicant.

Since written examinations are required in qualifying for the various grades of licenses, it seemed desirable to provide the applicants with reference material containing the basic information necessary in preparation for the examination. While the manual has been prepared to meet this especial need in Texas, it has equal value for any water works superintendent or operator who desires a compact review of the essentials of water treatment methods.

Prepared especially for in-service training of water department personnel, the manual secures brevity by the elimination of factual data that can reasonably be expected to be the common knowledge of all well informed operators. Through the use of references placed at chapter endings, supplemented by an appendix listing useful publications; the reader is stimulated to extend his technical reading in the water works field.

The manual will be a desirable addi-

tion to the library of a water works department, where it will lend encouragement to the operator who wishes to improve his technical qualifications by in-service training.

The public health administrator will be interested in the emphasis that the publication of this manual gives to the need for employing water works personnel with special training, who are qualified to assume the responsibility for the production of safe potable water for public use. EARNEST BOYCE

A Textbook of Hematology—*By William Magner, M.D., D.P.H. Philadelphia: Blakiston, 1938. 395 pp. Price, \$4.50.*

This excellent work merits a high degree of popularity among students, technicians, and practitioners of medicine. After careful study of its style, its contents, and the arrangement of its material, such a statement can be made without qualification. There were already so many good and dependable texts on hematology in our libraries the publishers must have recognized well its fine qualities before they agreed to undertake its manufacture.

The diction is clear and direct like that used by an experienced teacher. No words are wasted in discussions of controversies; the point of view of the proponent of each theory is explained briefly; at the end a single sentence places the entire matter where it seems to belong. Two instances may be noted to illustrate this method. With regard to the origin of the monocyte, various theories are credited to the proper individuals, then: "It would appear that the weight of evidence is in favor

of the view that monocytes arise from reticular cells, chiefly in the spleen and connective tissues." The differential enumeration of the granulocytes as initiated by Arneith and as modified and changed by Schilling, Booke, and Ponder, and others is explained briefly but clearly. The section ends with this statement: "The experienced hematologist will find that the more familiar he becomes with Schilling's theory and method, the more will he be attracted to the hemogram as a method of analyzing the blood picture."

The first part of the book deals with the blood and its various elements in health and in disease; a chapter is devoted to laboratory methods; then the anemias and finally the leukemias are discussed—briefly but satisfactorily. In the excellent bibliography and the carefully prepared index one finds no mention of the Niemann-Pick nor of Gaucher; considering the rarity, and difficulty in diagnosis of the conditions associated with these names, their omission is not serious.

A. P. HITCHENS

The Psychology of the Unadjusted School Child—By John J. B. Morgan (rev. ed.). New York: Macmillan, 1937. 339 pp. Price, \$2.25.

This revision of Dr. Morgan's application of mental hygiene to the understanding of the school child (at home as well as at school) is characterized by the directness and clarity, as well as by the authenticity, which marked the original edition (1924). Since 1925, the author has studied more than 2,500 children in the Psychological Clinic at Northwestern University, and his understanding and precise description of children's problems have been enriched by this experience.

"The majority of queer people whom we encounter did not become that way suddenly, . . ." says the author in his opening paragraph. "They started

early in life, often in infancy or childhood, and progressed by almost imperceptible degrees into the confirmed eccentricities that we now see." The queerness and eccentricities of adults, and even "the more extreme peculiarities that distinguish some types of mental disorder," may often be prevented if the maladjustments developing in the child are corrected. To every child, if he is to grow into a mentally healthy adult, there must be given opportunity for the joy of achievement and the satisfaction which comes from solving life's problems, himself. These, the author believes, will enable the child, as he grows up, to meet difficulties easily—even gladly.

The book is an excellent practical guide to teachers and parents.

FREDERICK W. BROWN

The Compleat Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics—By Wilbur C. Davidson, M.D. (2nd, rewritten ed.) Durham, N. C.: Duke University Press, 1938. 250 pp. Price, \$3.75.

This is a valuable compendium of pediatric materials, encyclopedic in nature, which has been prepared as a ready reference for practitioners of medicine especially interested in pediatrics. Essential information gleaned from recent pediatric literature finds a place in this unique volume. It is arranged in convenient, concise form so that any of the diseases of infancy and childhood may be traced easily as to symptoms and signs, differential diagnosis, and treatment. A very helpful chapter is included on laboratory and other procedures frequently used in pediatrics. The preventive aspects of modern pediatrics are stressed especially in the chapters dealing with nutritional requirements, gastrointestinal and circulatory diseases, metabolic and glandular groups. The extensive bibliography accompanying the book and the detailed

index add greatly to its value as a reference volume.

RICHARD A. BOLT

Diet and High Blood Pressure—
By Dr. I. Harris. Toronto, Ont., Canada: Longmans Green, 1937. 196 pp. Price, \$3.50.

This is a readable book written "for the normal individual, and not for people suffering from high blood pressure." It is based on research done under the direction of the author, on the problem of high blood pressure. It has led him to feel sure that by correct dieting the life of those suffering from high blood pressure can be prolonged. He is emphatic on prevention, and holds that no drugs will ever cure "heart disease." He says, "We put our faith in miracles, in bottles of medicine, in fashionable spas. Believe me, they are false gods; they cannot help us. There is only one way to good health and longevity—obey strictly the laws of living." He warns against gluttony, calling attention to the fact that in the past food had a different meaning than at the present, owing to the difficulty of obtaining it. "In those days a feast performed a vital function. . . . The ritual still remains. Communal feeding is apparently still the only way to mark an auspicious occasion or to do honour to an individual. . . . Public feeding in modern times is an orgy of gross over-indulgence. To gorge food and drink until our senses are benumbed is surely a crude form of sensuality. . . . Our banquets have the broad features of worship of sensuality."

While some of the author's views will be considered extreme by many, in general his teaching is sound. "The golden rule in eating is moderation and variety. There is hardly any type of food or drink which can do harm as long as one lives up to this maxim. . . . As long as one is moderate there is

very little that man cannot eat and drink."

The book ends with an appendix of 53 pages giving a number of diets, food values, and excellent recipes for preparing the foods advised. The book is easily written and may well be studied by a great variety of readers.

MAZÛCK P. RAVENEL

Safe Living—*By C. W. Hippler and Helen Burr Durfee. New York: Sanborn, 1937. 188 pp. Price, \$.80.*

It is amazing how many safety factors exist in the environment in which children of school age live, for this is a book primarily for children. The text is a record of plausibly real experiences by the children themselves.

The recounting is largely in dialogue, partly in description. The teacher's participation is behind the scenes. It is the children who develop the problems and find the solutions. There is a ring of earnest sincerity in the text as if the authors were impelled by deep conviction.

The fields for safety the book covers are school, going to and from school, home, neighborhood, highway, farm, and vacation. The chapter on Safety and Health reviews briefly some of the general health practices particularly applicable to children. An excellent book.

W. W. PETER

Let's Help the Doctor—*By Margaret O'Donovan Rossa, R.N. New York: The Devin-Adair Company, 1937. 141 pp. Price, \$1.50.*

This book had two origins. The overwhelming cost of hospital care and nurses for the average one-salaried family. The lack of information among intelligent mothers about what to do for the sick at home.

Out of her own experience and observation as a private duty nurse the author assembled this compendium. It attempts to give instruction of a kind

in many directions so that mothers may know what to do and what not to do to help the doctor in cases of sickness which can be cared for in the home.

W. W. PETER

Father's Doing Nicely—*The Expectant Father's Handbook*—By David Victor. Foreword by George W. Kosmak, M.D., drawings by Tom Torre Bevans. New York: Bobbs Merrill. 170 pp. Price, \$1.50.

The expectant father has been the butt of many good natured jokes. Classes for expectant fathers have been formed in few places. Obstetricians and nurses have had to deal with "paternity pains" as best they could. All this calls for a plain statement of the facts illustrated with caricature and humor which the average man can well understand. This delightful book fills such a need. From the outside cover to the last page it affords an antidote to the fears and forebodings of "the forgotten man of procreation." Intermingled with the humor and drawings there is a serious strain which emphasizes the essential acts in the drama of childbirth in such a manner that it will pass through the mails without censorship. As Dr. Kosmak points out in the foreword, "in recommending the book for prospective fathers, attention can be directed to the fact that it should prove of equal value to their wives."

RICHARD A. BOLT

The Sanitary Inspector's Handbook: A Manual for Sanitary Inspectors and Other Executive Public Health Officers—By Henry H. Clay. (3rd ed.) London: Lewis, 1937. 480 pp., 95 ill. Price, \$5.00.

The demand for the second edition (1936) of this admirable work made it possible to publish this edition synchronously with the coming into operation of the British Public Health Act, 1936. References to new Acts,

Regulations, and Byelaws have been made in considerable detail because of their importance to all public health administrators and sanitary inspectors of Great Britain. Such thorough revision as has seemed necessary has resulted in the third edition being nearly 100 pages larger than the first.

While this volume is intended specifically to be a guide and reference text for sanitary inspectors working under the English regulations, and therefore invaluable to them, it is truly a mine of information for all others as well who are concerned with the public health. The arrangement of the material which constitutes nearly all of the 31 chapters is in keeping with other rare qualities of the book. First there is explanatory matter, then are quoted the legal provisions which pertain to the subject, and the chapter ends with an exhaustive discussion of accessory information intended to give the inspector an adequate background for his work.

The final chapter contains "Useful Memoranda and Glossary of Building Terms." This includes data of all varieties from the value of "pi" to the definition of "Brick Nogging."

It has not been possible to find in the excellent index any reference to the sanitation of public eating and drinking establishments. Supervision of the cleansing of tableware and beer glasses is probably not a function of the sanitary inspector.

The book is admirable in every way and its usefulness is not by any means localized by its having been written around British Acts, Regulations and Byelaws.

A. P. HITCHENS

Programs for Local Tuberculosis Associations — Administrative Series No. 4—Prepared by Murray A. Auerbach. New York: National Tuberculosis Association, 1937. 67 pp. Price, \$5.50.

As a chart for executives in charge of local tuberculosis associations, it would be hard to excel this monograph. It is a scholarly and thorough piece of work that demonstrates the wide knowledge of programs that have been carried on and their successes and failures, and the fundamentals of an intelligent approach to tuberculosis work. Not only that, but the author shows that he has had enough experience to recognize the value of good community organization and to know how to get it.

From the point of view of those interested in community health programs extending beyond the field of tuberculosis, one is impressed by the fact that there needs to be the closest possible coördination of tuberculosis programs with those of other agencies in the health field. Their work touches at many points. Many of the technics and programs suggested will be useful to any health executive. They should be helpful to the official health commissioner in knowing how to use community resources and the most effective means of coöperating with the local tuberculosis association.

While the tuberculosis problem remains an outstanding one in spite of the progress that has been made, and a big job still lies ahead, nevertheless its very successes make it clear that the time will come when the problem will be sufficiently under control that tuberculosis organizations will naturally develop into community health organizations in which their possibilities will be practically unlimited.

For the tuberculosis secretary comparatively new to his work, Mr. Auerbach's treatise will be a boon. For the experienced executive, these ideas so clearly set forth, will prove decidedly helpful. He may well use these programs even though they do not presume to be complete, to check on his own activities. As a concise, practical

presentation, this little pamphlet sets a high mark. BLEECKER MARQUETTE

Journal of Milk Technology—Vol. I, No. 1, October, 1937, to Vol. I, No. 3, March, 1938. Official publication of the International Association of Milk Sanitarians, 17-19 Day Street, Orange, N. J. Subscription price, \$5.00.

The familiar blue covered report issued yearly by the International Association of Dairy and Milk Inspectors has undergone a metamorphosis after the publication of the *25th Annual Report* of this Association. The proceedings of this Association, which changed its name in 1936 to the International Association of Milk Sanitarians, are now to appear in the form of a blue covered bi-monthly journal known as the *Journal of Milk Technology*.

Three numbers of this journal have already appeared and are sufficient to show that this method of publication is an improvement on the older method as it not only permits the printing of the papers presented at the annual meeting of the association but also allows the insertion of a certain amount of new and current material. Papers of particular importance to dairy and milk inspectors are also being abstracted, making the publication one of very real value to all men interested in dairy and milk inspection work. As the journal is the official publication of the association, all members of the association receive it without any increase in the membership dues of \$5 a year.

ROBERT S. BREED

Clinical Psychology: A Handbook of Children's Behavior Problems—By C. M. Louttit. New York: Harper, 1936. 695 pp. Price, \$3.50.

If one were to evaluate this book entirely on the basis of its more than 800 summaries of the most recent research in the field of clinical psy-

chology and the 60 other extensive quotations from case histories of behavior problems and their treatment, it would be described as a well organized and carefully documented reference book. The author's clear interpretation of his material and the practical applications of it give it added value as a "textbook for students of clinical psychology."

Its contents may be briefly indicated:

Part I—Methods, includes an introductory chapter and two chapters on Diagnostic Methods, devoted to Anamnesis and Examination and to Psychometrics, respectively.

Part II—Problems Correlated with Abilities, deals with the following topics, to each of which a chapter is given: Mental Deficiency or Feeble-Mindedness; School Retardation; Specific Disabilities in School Subjects; and Superiority.

Part III—Primary Behavior Problems, contains 6 chapters covering the following subjects: Behavior Problems: Introduction; Conduct Problems; Juvenile Delinquency; Speech Defects; Personality Problems; Psychoneuroses and Psychoses.

Part IV—Problems Correlated with Organic Disabilities is divided into two chapters, the first dealing with Sensory Defects and the second with Neurological and Physical Disabilities.

A list of references and a good index complete the volume.

In a foreword L. T. Meiks, M.D., emphasizes the unique opportunities of the family physician and the pediatrician for observation and intimate knowledge of the family background of children under their care and the recognition "of many of these behavior disorders in their incipience, before the untrained associates of the child realize that the reactions are in any way undesirable. An enlightened medical profession," he says, "can do much to prevent the development of these disorders and to handle them in the proper fashion once they have appeared." Both Dr. Meiks and the author recognize the need for the specialized technics of the trained psychiatrist and clinical psychologist in solving many behavior problems. Running throughout the book

is the refrain, "Treat the child as an integrated whole."

The book should serve its purpose well, whether its reader be the embryo psychoclinician, to whom it is addressed, the medical student, or the physician or school administrator seeking to keep abreast of the most recent work in the field of clinical psychology.

FREDERICK W. BROWN

More of My Life—By Andrea Majocchi. New York: Knight Publishers, 1938. 313 pp. Price, \$2.50.

All who read *Life and Death* will welcome this addition to the autobiography of Italy's famous surgeon. The author speaks of these new stories as "Pages from my life . . ." "notes torn from a surgeon's diary," yet they have, as he says, a definite relationship to one another although apparently little connected. To a certain extent it is a biographical sketch of a great friend and senior surgeon, Dr. Franco Forti.

Biographies, even of the humblest people, if they are sincere, carry much of interest. When we have the story of a man who has come into contact with life in so many varied forms as the author of this book, it cannot but be of intense interest. Some of the chapters have been dedicated to three persons, an unknown patient, a nun, and a priest, who had been deeply moved by reading *Life and Death*. We have no hesitation in picking out these chapters as easily the best in the book, *The Sacrifice*, *The Hymn to the Sun*, *Mass at the Front*, and *Sunset*. To these we would add, *Human Depths*.

It seems to have become the fashion for doctors to write autobiographies. Among those which have appeared, this stands easily among those at the top. It is the story of a man who has worked hard, studied both books and men, has loved his kind and devoted his life to their betterment. Above all, it is simple

and sincere. It can be recommended without reservation.

The book is beautifully printed and gotten up. It is a pity that the translator did not consult a doctor, which would have avoided several errors which jar on the professional man.

MAZÏCK P. RAVENEL

Step by Step in Sex Education—
By Edith Hale Swift, M.D. New York: Macmillan, 1938. 207 pp. Price, \$2.00.

This is a unique presentation of sex education material arranged in dialogue form between parents and a boy and girl in the normal relations of family life. It proceeds step by step as the children advance in age to give them a scientific nomenclature of sex anatomy and physiology, at the same time revealing to each child the personal and social implications of sex. It is written primarily for parents who are at a loss to know how to approach the subject when confronted by the curiosity and perplexing questions which modern children present. It is clothed in everyday conversational style and is clear and concise without a trace of morbidity, although the author does not stop at introducing the most intimate situations in sex relations. The only part of the book which might arouse controversy is that dealing with contraception, which is confined to a few pages at the end.

RICHARD A. BOLT

Fluorine Intoxication—A Clinical-Hygienic Study, with a review of the literature and some experimental investigation—*By Kaj Roholm. Copenhagen: Nyt Nordisk Forlag—London: H. K. Lewis and Co. Ltd., 1937. 364 pp.*

In a succinct review, it is impossible to do adequate justice to what is probably the outstanding contribution to the literature of fluorine. The thorough

manner in which the author deals with the subject expresses itself in a monograph which includes 57 tables, 96 figures, and a bibliography of 893 references.

Although primarily begun as an industrial hygiene study, the author has encompassed the whole field of fluorosis in a manner that makes the book one of equal interest to those in other branches of medicine, especially pediatricians, orthopedists, and radiologists, as well as epidemiologists, dentists, biochemists, veterinarians, and agriculturists.

The discussion of the prevention of fluorine intoxication embraces the whole group of fluorine compounds found in industry. The author states (p. 310) that "it would be desirable to forbid the employment of males under 18 years and females as a whole, on work with fluorine compounds which give off dust or vapour." The necessity for control of all sources where fluoric dust or vapor is generated, is emphasized in detail, not only with respect to the workers but to that area surrounding the factory that might become contaminated by volatile fluorine compounds.

Although numerous experiments in induced experimental fluorosis have shown considerable storage of fluorine in the bones with a resultant development of defective osseous structure, Roholm demonstrates that comparable conditions are not uncommon among cryolite workers.

In a chapter entitled "Post Mortem Examinations of Two Cryolite Workers," the author records (p. 184): "After *Skeletonizing*, the bones present marked changes. All are of a chalky-white color, the surface is irregular and the weight considerably increased." Calcification of the ligamentous attachments was commonly observed. The fluorine content of the costal bones was 9.9 and 11.2 mg. per gm. of bone ash respectively whereas about 0.5–2.1 mg. of fluorine per gm. of bone ash is re-

ported for 11 normal human costal bone samples. These two workers had been exposed for 9 and 24 years respectively to cryolite ($\text{Na}_3 \text{Al F}_6$) dust with a calculated fluorine intake daily of about 0.20–0.35 mg. of fluorine per kg. of body weight.

The author also observes that among 5 children "born of women who either worked at the cryolite factory before or during pregnancy or started to work soon after the birth, 3 showed a mottled enamel condition of the teeth" years later when the permanent teeth erupted.

From a diagnostic viewpoint, Roholm divides chronic fluorosis into three different stages.

1. The dental anomaly known in man as mottled enamel and in the herbivora as darmous or gaddur

2. Osteosclerosis, an occupational disease among cryolite workers and possibly other workers exposed to relative large amounts of fluoride

3. An osteomalacia-like disease endemic among herbivora in the environs of certain factories in Europe

The dosage that can produce the various forms of this chronic intoxication is uncertain according to the author, but seems to rise from (1) to (3).

For those interested in any of the various phases of fluorine intoxication, this book is especially recommended.

H. TRENDLEY DEAN

The Subnormal Mind—By Cyril Burt, M.A., D.Sc. (Oxon.). (2nd ed.) New York: Oxford University Press, 1937. 372 pp. Price, \$5.00.

This volume is an assemblage of the third series of Heath Clark Lectures, delivered at The London School of Hygiene and Tropical Medicine in 1933, revised for publication. That a second edition was called for in a short time—the first appeared in 1935—is practical evidence of the favor which the book has received.

The opening chapter is devoted to the normal mind, hence the author proceeds to his presentation of the mentally deficient, the dull or backward, the delinquent, and the asthenic and the sthenic neuroses.

The American reader will be interested in the discussion of such English legislation as the Mental Deficiency Act of 1927. The author has brought together the findings of many English studies, including his own, and from these he presents statistical evidence as to prevalence and causes of the conditions dealt with. From these facts he draws his conclusions in what appears to be a reasonable and fair manner. The relationship between such environmental conditions as lead to lack of rest and to retardation in school is brought out forcibly.

Regarding the delinquent, the conclusion is: "About the value of preventive psychology or medicine in dealing with the adult criminal, I am, indeed, pessimistic; over the treatment of the juvenile offender, I am almost always hopeful, and the younger the case, the higher my hopes."

The book is well printed, the style is good, and the material well organized. There is no undue repetition, and the author is not dogmatic in his own point of view. Throughout, there runs a pleasant humanistic touch which gives conviction regarding the author's opinion. This volume is a worth while addition to the library of any worker in the broad field of child welfare.

GRANT FLEMING

The Collapse Therapy of Pulmonary Tuberculosis — By John Alexander, M.D., F.A.C.S. Springfield, Ill.: Thomas, 1937. 705 pp. Price, \$15.00.

The subject of collapse therapy of tuberculosis is covered in detail in this excellent book. Chapters one and two are devoted to the perspective of col-

lapse therapy in tuberculosis and the evolution of surgical therapy. Following are sections on physiological principles and pathology of pulmonary collapse by Dr. Max Pinner. Two chapters on pneumothorax are contributed by Dr. John Blair Barnwell and a chapter on oleothorax by Dr. Kirby Smith Howlett, Jr.

The author has admirably fulfilled his purpose, as stated in the preface, of writing a book for both surgeon and internist. Based on wide clinical experience, the indications and contraindications for the various operations that may be performed in the treatment of pulmonary tuberculosis are discussed. The section on "choice of operation" is of equal interest to all phthisiologists who are faced with the problem of determining the proper time for surgical intervention.

The technic, preoperative and post-operative management, as well as vari-

ous complications that may arise in each surgical procedure are described in detail. Discussions of operative technic are supplemented by excellent illustrations.

Exceptions may be taken to certain details and particularly the choice of anesthesia for thoracoplasty. Such criticisms, however, are of minor importance, as the work supplies, with authoritative clarity and in a practical and detailed manner, valuable information concerning all phases of the collapse therapy in tuberculosis.

The material is well organized and indexed, and extensive references to the literature are given. This work is recommended to all who are interested in the subject of tuberculosis.

The book is beautifully printed and the make-up fine. It is a typical example of the excellent products which come from the house of the printer.

BRIAN BLADES

BOOKS RECEIVED

PARASITOLOGY. With Special Reference to Man and Domesticated Animals. By Robert Hegner, Francis M. Root, Donald L. Augustine and Clay G. Huff. New York: D. Appleton-Century, 1938. 812 pp. Price, \$7.00.

MATERNAL CARE COMPLICATIONS. Dr. F. L. Adair, Editor. Chicago: University of Chicago Press, 1938. 95 pp. Price, \$1.00.

A GENERAL TEXTBOOK OF NURSING. By Evelyn C. Pearce. New York: Dutton, 1938. 888 pp. Price, \$3.75.

INSULIN. Its Production, Purification and Physiological Action. By Douglas W. Hill and Frederick O. Howitt. New York: Chemical Publishing Co., 1936. 219 pp. Price, \$5.00.

SOUTH ITALIAN FOLKWAYS IN EUROPE AND AMERICA. A Handbook for Social Workers. New Haven: Yale University Press, 1938. 216 pp. Price, \$2.50.

PHYSICAL AND HEALTH EDUCATION. Principles and Procedures. By Helen Norman Smith and Helen Leslie Coopes. New York: American Book Co., 1938. 323 pp. Price, \$2.25.

INTRODUCTION TO BACTERIOLOGICAL CHEM-

ISTRY. C. G. Anderson. Baltimore: Wood, 1938. 278 pp. Price, \$4.00.

SWIMMING AND DIVING. By American Red Cross. Philadelphia: Blakiston, 1938. 271 pp. Price, \$.60.

SALARIES IN MEDICAL SOCIAL WORK IN 1937. By Ralph G. Hurlin. New York: Russell Sage, 1938. 34 pp. Price, \$.20.

REPORT OF THE HOSPITAL SURVEY FOR NEW YORK. By Arthur W. Jones and Francisca K. Thomas. Vol. III. New York: United Hospital Fund, 1938. 571 pp. Price, \$2.00.

MACLEOD'S PHYSIOLOGY IN MODERN MEDICINE. Edited by Philip Bard. 8th ed. St. Louis: Mosby, 1938. 1051 pp. Price, \$8.50.

TECHNICS FOR THE BACTERIOLOGICAL EXAMINATION OF DRINKING WATER. Fifteen methods currently in use. Health Officers' News Digest, Public Health Committee of the Cup and Container Institute, 30 Rockefeller Plaza, New York City, 1938. 10 pp. Mimeographed. Free upon application.

HEALTH GUIDES AND GUARDS. By Francis P. Wall and Louis D. Zeidberg. New York: Prentice-Hall, 1938. 380 pp. Price, \$1.40.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Food for Thought—Complacent sanitarians will be shocked to learn that smallpox has been increasing since 1934. In 1937, more than 11,000 cases occurred, and during the first 20 weeks of 1938 the incidence was twice as high as during the same time last year. With the exception of India, and one or two other benighted countries, the grand old U. S. enjoys the highest smallpox rates. The problem is confined generally to the central and western states.

ANON. Prevalence of Communicable Diseases in the United States. *Pub. Health Rep.* 53, 23:935 (June 10), 1938.

How May Nursing Services Be Measured?—Total home and school visits and clinic attendances is an unsatisfactory measure which, when vigorously applied, discourages the nurse from giving the health services her visits are intended to provide. Length of visit in the home is suggestive only in the lower brackets. Something should be done about developing valid indices of accomplishment rather than putting on heat through widespread use of quantitative measures.

BEAN, H. Number and Length of Nursing Visits as Indices of Nursing Services. *Pub. Health Rep.* 53, 22:913 (June 3), 1938.

Midwives in Great Britain—It is to be regretted that many American sanitarians will not have the opportunity to see this series of papers on British midwifery services, if only to open their eyes to the fact that in some European countries the midwife is a recognized public health servant on a par with the home visitor and the

technician. Of course, we do things better over here: with certain outstanding exceptions, we hide our collective head in the sand so we may blissfully ignore the whole problem.

BERKELEY, C., *et al.* The Operation of the Midwives Act, 1936. *Pub. Health.* 51, 9:257 (June), 1938.

Sound Health for All—Forcibly reminding us that a large part of public health activities are concentrated on the care of the known sick rather than devoted to the improvement of the apparently well, the future program had better be pointed to improving housing, better application of the principles of nutrition, development of mental hygiene, and the encouragement of physical fitness, suggests the author.

BOUDREAU, F. G. Family Health Goal of Public Health. *Pub. Health Nurs.* 30, 6:346 (June), 1938.

Pollution Movement from Latrines—Chemicals placed in a typical privy vault can be recovered over 300 feet away, but fecal organisms were limited to a 10 foot dispersion. In pervious soils the colon organisms did not penetrate more than a foot below a dry latrine, and only about 6 feet from a wet latrine. Probably there are many more findings of importance to sanitarians in the 67 pages in three papers devoted to this subject.

CALDWELL, E. L. Pollution Flow from a Pit Latrine When Permeable Soils of Considerable Depth Exist Below the Pit. *et seq.* *J. Infect. Dis.* 62, 3:225 (May-June), 1938.

Where Knowledge Is the First Need—Detroit's negro population tripled in 17 years. Essentially a rural people, city environment raises havoc

with them. The infant death rate was 5 times that of the white population. Health education was and is badly needed. How Detroit meets the need is interestingly told.

CONNOLLY, M. P. Helping the Negro to Help Himself. *Health Officer*. 3, 1-2:19 (May-June), 1938.

Poliomyelitis Epidemiology — Prevalence of poliomyelitis since 1916 is considered, and distribution of the disease by counties during the last 5 year period is reported. Although the disease is country-wide, it is extremely irregular in its appearance; in some outbreaks only a few counties are involved, in others whole regions. Case and fatality rates showed great variation from year to year and place to place. One conclusion is that we should make more epidemiologic studies as well as expand laboratory research.

DAUER, C. C. Studies on the Epidemiology of Poliomyelitis. *Pub. Health Rep.* 53, 25:1003 (June 24), 1938.

Common Sense Advice about Health Education—Health education will be effective to the extent that all departmental staff members are giving the same advice, that the medical profession agrees with the advice, that health workers practise what they preach, and talk in terms intelligible to the public, that they appeal to basic wants, and avoid giving advice which the recipient may know or think not to be true in his case.

DERRYBERRY, M. Taking the Public with You. *Health Officer*. 2, 12:615 (Apr.), 1938.

Mumps — Encephalitis following mumps is not so unusual as it was thought to be and may occur when the symptoms are mild.

FINKELSTEIN, H. Meningo-Encephalitis in Mumps. *J.A.M.A.* 111, 1:17 (July 2), 1938.

Tick Fever—Where and when spotted fever infections have been re-

ported over a period of 5 years. The Southeast and the Rocky Mountain states have had most cases.

HAMPTON, B. C., and EUBANK, H. G. Rocky Mountain Spotted Fever. *Pub. Health Rep.* 53, 24:961 (June 17), 1938.

Fats, Dyes, and Mystery—What every young lady health worker should know about soap, powders, creams, lotions, sunburn preventives, rouge, lipstick, dyes, nail polishes, hair tonics, deodorants, depilatories, etc., etc. Men will be interested, too. Health educators will wish for some way to measure the buying habits of lady sanitarians before and after taking this excellent advice.

HAZEN, H. H. Cosmetics. *Am. J. Nurs.* 38, 7:791 (July), 1938.

Counting Missing Teeth—Tooth mortality rates in grade school children in Hagerstown were determined by counting extracted permanent teeth. Analysis of the data is concerned with: mortality by kinds of teeth, in relation to fillings, and numbers of missing teeth per child.

KNUTSON, J. W. Studies on Dental Caries. *Pub. Health Rep.* 53, 25:1021 (June 24), 1938.

Some Working Hypotheses on Cancer—This we know: we can induce certain cancers at will, and prevent their appearance; but there are many well defined questions to be answered which may turn about two conceptions (1) irreversible metabolic changes leading to growth processes, and (2) interaction of growth stimulating factors and viruses. The paper should be read by all.

LOEB, L. The Causes of Cancer. *Sci. Month.*, July, 1938, p. 51.

About Tuberculosis—Just about the clearest discussion of tuberculosis infection and resistance that has been presented to health workers. Instead of childhood and adult types of tuber-

culosis infection, the authors urge the use of primary infection and reinfection tuberculosis. Reinfection occurs when the forces of defense are down, or when the second invasion is overwhelming. Since 1850 the destructiveness of tuberculosis has waned, though it is still the chief cause of death in young and middle-aged adults, and hence our most important public health foe.

MARGULIS, A. E., and PINNER, M. Pathogenesis of Tuberculosis. *Pub. Health Nurs.* 30, 7:412 (July), 1938.

British Health Nurses and Ours—Comparing public health nursing in Great Britain and America, it is discovered that the major problems—insufficient nurses, inadequate educational facilities, unsatisfactory living conditions and salaries—are pretty much the same in both countries.

McIVER, P. The Nurse's Contribution to the British Public Health Program. *Health Officer.* 3, 1-2:15 (May-June), 1938.

Variable Streptococci—Confirmation of the theory that when streptococcus cultures are aged under unfavorable conditions, small viable forms are produced which are capable of passing filters. Under suitable cultural conditions, they may assume visible forms. All this is very disturbing to us older sanitarians who learned our bacteriology when a streptococcus could be depended upon to remain a predictable germ.

NICHOLLS, E. E. A Study of the Organisms Recovered from Filtrates of Cultures of Hemolytic Streptococci. *J. Infect. Dis.* 62, 3:300 (May-June), 1938.

Canadian Milk Supplies—This series of papers covers about everything in its field: milk-borne diseases, laboratory methods, field supervision, pasteurization and tests for completeness, ending with the status of the milk supply in all Canadian municipalities.

PRICE, R. M. Bovine Tuberculosis in Children (and 15 other papers). *Canad. Pub. Health J.* 29, 6:251 (June), 1938.

Call to Arms against Cancer—Proposing a nation-wide cancer control scheme in which the state and federal governments might participate, the author points out that of the 420,000 annual deaths from cancer, from 25 to 30 per cent might be prevented by a thorough-going application of known control measures.

SCHERESCHEWSKY, J. W. The Prevention and Control of Cancer: A Plan for Nation-wide Organization. *Pub. Health Rep.* 53, 24:961 (June 17), 1938.

Menace of Mild Polio—Ill with poliomyelitis only 3 days, a child showed virus in the stools that persisted for 3 weeks. This suggests that mild and often unrecognized cases may be responsible for sewage pollution with the virus.

TRASK, J. D. Poliomyelitis Virus in Human Stools. *J.A.M.A.* 111, 1:6 (July 2), 1938.

ASSOCIATION NEWS

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-laws of the Association, the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, providing such petition is received fifteen days before the Annual Meeting." The *Chairman* of the Committee is Dr. John J. Sippy, San Joaquin Local Health District, Stockton, Calif.

The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in Kansas City will be elected for the three year term 1938-1941.

W. W. Bauer, M.D.
American Medical Association,
Chicago, Ill.

Walter L. Bierring, M.D.
State Commissioner of Health,
Des Moines, Ia.

E. L. Bishop, M.D.
Tennessee Valley Authority,
Chattanooga, Tenn.

Charles F. Bolduan, M.D.
Department of Health,
New York, N. Y.

Maud A. Brown
State Board of Health,
Helena, Mont.

Homer N. Calver
American Museum of Health, Inc.,
New York, N. Y.

Selwyn D. Collins, Ph.D.
U. S. Public Health Service,
Washington, D. C.

Dorothy Deming, R.N.
National Organization for Public Health
Nursing,
New York, N. Y.

J. V. DePorte, Ph.D.
State Department of Health,
Albany, N. Y.

Naomi Deutsch, R.N.
U. S. Children's Bureau,
Washington, D. C.

Godias J. Drolet
New York Tuberculosis and Health As-
sociation,
New York, N. Y.

Gordon M. Fair
Harvard University,
Cambridge, Mass.

Allen W. Freeman, M.D.
Johns Hopkins University,
Baltimore, Md.

Leonard Greenburg, M.D.
State Department of Labor,
New York, N. Y.

Gaius E. Harmon, M.D.
Herman Kiefer Hospital,
Detroit, Mich.

Emery R. Hayhurst, M.D.
Consultant in Industrial Hygiene,
Columbus, O.

Charles D. Howard
State Laboratory of Hygiene,
Concord, N. H.

Albert H. Jewell
Health Conservation Association,
Kansas City, Mo.

A. J. Lanza, M.D.
Metropolitan Life Insurance Company,
New York, N. Y.

James P. Leake, M.D.
U. S. Public Health Service,
Washington, D. C.

Nels A. Nelson, M.D.
State Department of Health,
Boston, Mass.

John F. Norton, Ph.D.
The Upjohn Company,
Kalamazoo, Mich.

J. L. Pomeroy, M.D.
County Health Officer,
Los Angeles, Calif.

I. C. Riggin, M.D.
State Health Commissioner,
Richmond, Va.

Grace Ross, R.N.
Department of Health,
Detroit, Mich.

Frederick W. Sabian, Ph.D.
Michigan State College,
East Lansing, Mich.

Vivien A. Van Volkenburgh, M.D.,
State Department of Health,
Albany, N. Y.

H. A. Whittaker
State Board of Health,
Minneapolis, Minn.

C.-E. A. Winslow, Dr.P.H.
Yale University,
New Haven, Conn.

C. C. Young, D.P.H.
State Department of Health Laboratory,
Lansing, Mich.

APPLICANTS FOR FELLOWSHIP

In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place between now and the time of the Kansas City Annual Meeting.

Health Officer's Section

Paul H. Brown, M.D., Dr.P.H., Health Commissioner, Stamford, Conn.

Millard C. Hanson, M.D., Dr.P.H., Director of Health, Toledo, O.

Lester C. Krotcher, M.D., Director, Local Health Administration, State Division of Public Health, Boise, Ida.

Alex M. Lesem, M.D., Health Officer, City and County of San Diego, San Diego, Calif.

Aaron Leifer, M.D., M.S.P.H., Medical Officer-in-charge Brownsville Health District, New York City Department of Health, Brooklyn, N. Y.

J. W. Roy Norton, M.D., M.P.H., Assistant Director, Division of Preventive Medicine, State Board of Health, Raleigh, N. C.

Domingo F. Ramos, M.D., D.Sc., Director of Health, Havana, Cuba

John C. Sleet, M.D., Health Commissioner, Norfolk, Va.

Kenneth H. Sutherland, M.D., Health Officer, Orange County, Santa Ana, Calif.

James O. Wails, M.D., C.P.H., Director, Nashoba Health Unit, Ayer, Mass.

Charge of District Public Health Laboratory, State Board of Health, Parsons, Kans.
John A. Toomey, M.D., Associate Pediatric, University Hospitals, Cleveland, O.
D. Evelyn West, B.S., Chief Microbiologist, Bureau of Laboratories, State Department of Health, Hartford, Conn.

Public Health Engineering Section

Samuel D. Macready, Sanitary Officer, State Board of Health, West Palm Beach, Fla.
Thomas M. Riddick, M.S. in C.E., Consulting Chemist, New York, N. Y.

Industrial Hygiene Section

William McK. Gafafer, D.Sc., Research Associate and Senior Statistician, U. S. Public Health Service, Washington, D. C.
Leonard J. Goldwater, M.D., Sc.D., Senior Industrial Hygiene Physician, Division of Industrial Hygiene, New York State Department of Labor, New York, N. Y.
Harry F. Wilson, M.D., C.P.H., Director, Division of Industrial Hygiene, State Board of Health, Columbia, S. C.

Laboratory Section

Henry E. Cope, M.D., Associate, Owen Clinical Laboratories, Detroit, Mich.

Joseph A. Kasper, M.D., Director, Bureau of Laboratories, Department of Health, Detroit, Mich.

Raymond E. Leach, A.B., Bacteriologist in

Food and Nutrition Section

Matthew E. Highlands, S.M., Assistant Professor of Bacteriology, University of Maine, Orono, Me.
Abraham Lichterman, Ph.D., Acting Director of Foods and Drugs, Department of Health, New York, N. Y.

Ira A. Manville, M.D., Ph.D., Clinical Associate, Professor of Medicine, University of Oregon, Multnomah, Ore.

Rachael L. Reed, M.D., Director, Kansas City Dairy Council, Kansas City, Mo.

Henry T. Scott, Ph.D., Director of Research, Wisconsin Alumni Research Foundation, Madison, Wis.

Donald K. Tressler, Ph.D., Head, Chemistry Division, New York State Agricultural Experiment Station, Geneva, N. Y.

Child Hygiene Section

Jacob A. Salzmann, D.D.S., Director, Dental Service, New York City Vocational Schools, New York, N. Y.

Harry Strusser, D.D.S., Chief, Division of Dental Service, Department of Health, New York, N. Y.

Charles C. Wilson, M.D., Director of Health and Physical Education, Public Schools, Hartford, Conn.

Public Health Education Section

H. Shirley Dwyer, D.D.S., Supervising Dentist, Department of Health, New York, N. Y.

Public Health Nursing Section

Olive M. Whitlock, B.S., Director, Division of Public Health Nursing, State Board of Health, Portland, Ore.

Epidemiology Section

William L. Aycock, M.D., Assistant Professor of Preventive Medicine and Hygiene, Harvard Medical School, Boston, Mass.

Martin R. Beyer, M.D., State Epidemiologist,

State Department of Health, Oklahoma City, Okla.

G. Howard Gowen, M.D., Ph.D., Assistant Epidemiologist, State Department of Health, Springfield, Ill.

Eschscholtzia L. Lucia, Ph.D., Assistant Professor of Biometry, University of California, San Francisco, Calif.

Henry E. Meleney, M.D., Associate Professor of Preventive Medicine and Public Health, Vanderbilt University School of Medicine, Nashville, Tenn.

Franklin H. Top, M.D., D.P.H., Medical Epidemiologist, Detroit Health Department and Herman Kiefer Hospital, Detroit, Mich.

Unaffiliated

Travis P. Burroughs, M.D., C.P.H., Secretary, State Board of Health, Concord, N. H.

Garner M. Byington, M.D., Director, Medical Relations, Department of Health, Detroit, Mich.

Frederick Eberson, M.D., Ph.D., Epidemiologist, Bureau of Communicable Diseases, Department of Health, San Francisco, Calif.

Walter H. Hartung, M.D., State Director of Health, Columbus, O.

John B. Hawley, M.S., Consulting Engineer, Fort Worth, Tex.

John O. McCall, D.D.S., Director, The Murry & Leonie Guggenheim Dental Clinic, New York, N. Y.

Harry E. Ungerleider, M.D., Assistant Medical Director, Equitable Life Assurance Society of the United States, New York, N. Y.

CLOSING DATE FOR SUBMITTING APPLICATIONS FOR FELLOWSHIP

SEPTEMBER 1 is the latest date the Committee on Eligibility can accept Fellowship applications. This date is set in order that there may be sufficient time to route them through the preliminary steps necessary before they

receive final consideration at the hands of the Governing Council during the Kansas City Annual Meeting. Eligible members who wish to apply for Fellowship are therefore urged to submit their applications in the near future.

CORRECTION

In a review of the *Report on the British Health Services, by the Health Group of PEP*, published by PEP, 16 Queen Anne's Gate, London, published on page 787 of the June issue of the JOURNAL, an error appeared due to a mistake in the original *Report* which

has been later corrected by an Erratum.

Instead of "... According to one of the tables, in 1933 and 1934 there were 59 diphtheria deaths per 1,000 boys, ages 2-5, and 55 diphtheria deaths per 1,000 girls, ages 2-5 ..." this should read "death rate per 100,000 living," not "per 1,000."

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

- Charles A. Arneson, M.D., 400½ Main St., Bismarck, N. D., City Health Officer
 Manuel S. Barreto, M.D., C.P.H., 113 Soublet St., Valencia, Venezuela, S. A., Health Officer
 Robert L. Cherry, M.D., C.P.H., State Dept. of Health, Kaufman, Tex., Director, Public Health District 3
 Leo F. Chess, M.D., Reed City, Mich., Health Officer
 Ramon Fernandez Marchante, M.D., Public Health Unit, Fajardo, P. R., Chief, Public Health Unit
 C. K. Heady, M.D., 26 Cherry St., Milford, Conn., Health Officer
 Willis B. Johnson, M.D., Box 1325, Rt. 4, Everett, Wash., Snohomish County Health Officer
 William W. Kelly, M.D., Bellin Bldg., Green Bay, Wis., President-Elect, State Board of Health
 Joseph T. Marshall, M.D., Gainesboro, Tenn., Assistant Director, Upper Cumberland Health District
 William C. D. McCuskey, M.D., 60-14 St., Wheeling, W. Va., Member, West Virginia Public Health Council
 William B. Nies, M.D., Court House, Fort Worth, Tex., Tarrant County Health Officer
 Arthur B. Robins, M.D., 534 E. 87 St., New York, N. Y., Supervisor of Clinics, Bureau of Tuberculosis, Department of Health
 Lloyd H. Smith, M.D., Box 418, Coulee City, Wash., Health Officer, Grant and Douglas Counties, and Grand Coulee District
 Alvin L. Stebbins, M.D., 803 N. Palafox, Pensacola, Fla., Director, Pensacola-Escambia County Health Unit
 H. E. Stroy, M.D., 107 S. Main, Osceola, Ia., Member, State Board of Health
 Roy B. Weathered, M.D., Eldorado, Kans., Butler County Health Officer

Laboratory Section

- A. P. Black, Ph.D., University of Florida, Gainesville, Fla., Professor of Agricultural Chemistry
 Josephine M. Day, Santa Maria Hospital, Santa Maria, Calif., Laboratory Technician, Santa Barbara County Health Dept.
 Melvin E. Koons, Box C, University Station, Grand Forks, N. D., Director, Public Health Laboratory

Norman C. Laffer, Ph.D., Box 4302, University Station, Tucson, Ariz., Teacher of Bacteriology, University of Arizona

Vital Statistics Section

- Margaret M. Crowe, City Hall, Kansas City, Mo., Registrar, Bureau of Vital Statistics, Health Dept.
 Rose A. Marks, 3218 Linwood Blvd., Kansas City, Mo., Statistician, Health Dept.
 Pauline V. Turner, 2680 Bancroft Way, Berkeley, Calif., Student

Public Health Engineering Section

- Raymond C. Freeman, Colerain, N. C., Sanitarian, State Board of Health
 Arthur G. Fuller, 4554 S. 3rd, Louisville, Ky., Sanitary Engineer, City Health Dept.
 Paul M. Kiel, 25 Sycamore St., Tiffin, O., State Dept. of Health (At present—Trainee at University of Michigan)
 Sigvard J. Nielsen, 25 Fordonia Bldg., Reno, Nev., Sanitary Inspector, State Board of Health
 Darwin E. Hoffert, 1214-14 Ave. N., Fargo, N. D., District Sanitation Supervisor, State Dept. of Health
 James R. Spence, Fayette, Ala., County Sanitation Officer, State Board of Health

Industrial Hygiene Section

- Hugh P. Brinton, Ph.D., 3016 Dumbarton Ave. N.W., Washington, D. C., Associate Statistician, Division of Industrial Hygiene, U. S. Public Health Service
 Clayton L. Hawkins, M.D., 2701 Welton St., Denver, Colo.
 Leroy W. La Towsky, 2506 N. 55 St., Omaha, Nebr., Student

Food and Nutrition Section

- Wallace P. Elmslie, Ph.D., Moorman Mfg. Co., Quincy, Ill., Director of Research
 Robert F. Huntley, Sealright Co., Inc., Fulton, N. Y., Technical Director, Charge of Bacteriological and Chemical Research and Control

Child Hygiene Section

- Burke C. Brewster, M.D., 467 E. Weatherford St., Fort Worth, Tex., Director of Health, Fort Worth Independent School System
 Rhoda Larsen, R.N., Mantua, Utah, Emery County Public Health Nurse

Mary W. Tobin, Duquesne University, Pittsburgh, Pa., Dean, School of Nursing

Public Health Education Section

Sidney F. Ascher, 42 Cherrydale Ave., Springfield, Mass., Student

Robert S. Drews, M.D., Dr.P.H., 3263 Joy Rd., Detroit, Mich., Student

Viola G. Pfrommer, Colby Junior College, New London, N. H., Chairman, Dept. of Health and Physical Education

Lewis C. Robbins, M.D., C.P.H., State Board of Health, Indianapolis, Ind., Local Health Administrator

K. Frances Scott, M.D., 33 State St., Northampton, Mass., Associate Professor of Hygiene, Smith College

Richard H. Shryock, Ph.D., Department of History, University of Pennsylvania, Philadelphia, Pa.

H. D. Voorhies, D.D.S., 2002 N. Hallock St., Kansas City, Kans., Assistant City Dentist

Public Health Nursing Section

M. Grace Fate, R.N., 221 Third St., Peoria, Ill., Staff Nurse, Health Dept.

Winnifred H. Jarvis, 19 North 2nd East, Brigham, Utah, City Public Health Nurse

Maria Johnson, Latter Day Saint Hospital, Salt Lake City, Utah, Superintendent of Nursing

Ima Martin, R.N., Milledgeville, Ga., Itinerant District Nurse, State Dept. of Public Health

Ila Z. Moore, 1115 E. High St., Jefferson City, Mo., Field Advisory Nurse, State Dept. of Health

Ellen Perdue, 314-14 St., Denver, Colo., Superintendent, Denver Visiting Nurse Association

Jessie M. Roach, Romney, W. Va., Hampshire County Public Health Nurse

Bertha B. Stevens, R.N., 475 E. Walnut, Springfield, Mo., District Public Health Nurse, State Board of Health

Epidemiology Section

George M. Leiby, M.D., Dr.P.H., State Board of Health, Raleigh, N. C., Consultant, Venereal Disease Control, Division of Epidemiology

Atilio Macchiavello, M.D., Dr.P.H., Casilla 3629, Santiago de Chile, S. A., General Director of Public Health

William E. Mosher, Jr., M.D., 65 Court St., Buffalo, N. Y., Epidemiologist-in-training, State Dept. of Health

Unaffiliated

Frederick Birnberg, D.D.S., 40 E. 49 St., New York, N. Y., Dentist, Department of Health

Marvin Liebman, 27 Lines St., New Haven, Conn., Student

DECEASED MEMBERS

R. S. Copeland, M.D., New York, N. Y., Elected Member 1918, Fellow 1922. Life Member 1936

Paul Eaton, M.D., Orange Park, Fla., Elected Member 1930

John N. Force, M.D., Dr.P.H., Berkeley, Calif., Elected Member 1920, Fellow 1934

Maurice C. Hall, Ph.D., D.V.M., Washington, D. C., Elected Member 1936

Vera H. Jones, M.D., Denver, Colo., Elected Member 1936

Renwick H. Leitch, D.Sc., Auchincruive, Ayr, Scotland, Elected Member 1933

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Nurse Placement Service, 8 South Michigan Avenue, Chicago, Ill., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS AVAILABLE

Two positions as medical director of county health units are open in Wisconsin. Duties largely administrative. Counties both rural, populations 15,000 and 40,000. Salaries: \$3,300 per annum plus approximately \$600 for travel. Applications may be sent to:

Dr. H. V. Gibson, Director
County Health Unit
Court House Annex
Eau Claire, Wis.

Dr. Milton Trautmann
State Board of Health
Madison, Wis.

POSITIONS WANTED

HEALTH OFFICERS

Physician, M.D., Class A medical school; M.P.H., Harvard School of Public Health; extensive experience in pediatrics and school medical service; also background of county health administration and teaching in medical school, will consider expanded opportunity in teaching or research. A302

Physician, M.D., St. Louis University; postgraduate in eye, ear, nose and throat; 10 years' experience in public health administration as director of county health units and epidemiologist with state department; also experienced in welfare administration, prefers administrative public health position in central or western state. Excellent references. A373

Physician, M.D., McGill; C.P.H., Johns Hopkins; excellent background of communicable disease control and school health service, seeks position as epidemiologist or public health administrator. A368

Experienced physician, administrator, epidemiologist, and teacher, now employed, with C.P.H. from Johns Hopkins, and 14 years' public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Experienced administrative health officer with excellent background is available for a responsible position with adequate salary. A375

Physician, M.D., Class A school; M.S.P.H., University of Michigan, 1937; now serving as district state health officer, seeks full-time administrative position in city or county. A367

Physician, experienced in health administration of cities and states, will consider attractive opening in maternal and child health or health education. A343

Physician with Dr.P.H. degree from Yale, now employed by state department of health, will consider position in general health administration, in infant welfare or in epidemiology. A300

Physician, long experienced in public health laboratory work and general administration, will consider attractive position. A295

MATERNAL AND CHILD HEALTH

Woman physician with excellent medical training and background of public health nursing experience, seeks position in maternity and infancy work. C376

Specially qualified and experienced physician in maternal and child health, has been director of state and local maternity programs, will consider a responsible position. A238

Woman physician, graduate of University of Iowa, who has directed state bureau of maternal and child health, now employed, will consider another position. C318

HEALTH EDUCATION

Well qualified woman in health education wishes position as health coordinator or health counselor. Has wide experience and Ph.D. from New York University. M236

Woman, M.D., Boston University; special work Columbia and Massachusetts Institute of Technology; interested in psychiatry; with one year's experience in State Hospital, desires position in the East in hospital for mental diseases or industrial school. H248

MISCELLANEOUS

Physician, graduate of Johns Hopkins Medical School and well qualified in medicine and tuberculosis, will consider a clinical position in the medical field. M377

Laboratory position desired by well trained bacteriologist and immunologist in routine laboratory or research work. L312

Experienced teacher in bacteriology and public health; Ph.D., Cornell; now professor in Grade A medical school, will consider teaching, executive or administrative position. M327

NEWS FROM THE FIELD

Proposed Tuberculosis Program

A SIX year federal and state spending program to bring about the control of tuberculosis was approved by the board of directors of the National Tuberculosis Association at its annual meeting in Los Angeles, June 20.

It was proposed that the plan be sponsored by the federal government, and that part of the costs be obtained from states and local governments after the manner in which highways, parks and other improvements are arranged.

out that tuberculosis could be brought under national control.*

Since that time Mr. Homer Folks has been working out the plan. He laid the general principles of it before the board of directors of the National Tuberculosis Association last February and received their approval for a continuance of the study with a special committee of the association of which Mr. Folks was chairman. The program presented is, in effect, the report of that committee.

COSTS OF TUBERCULOSIS CONTROL PROGRAM AS ESTIMATED TO GO THROUGH 6 YEAR PERIOD

The following is a summary of the costs on a chronological basis of the tuberculosis control program advocated by the National Tuberculosis Association:

<i>Fiscal Year</i>	<i>Hospital Construction</i>	<i>Hospital Maintenance</i>	<i>Case Finding</i>	<i>Total Six-Year Program</i>
1939-40.....	\$5,000,000	\$7,000,000	\$500,000	\$12,500,000
1940-41.....	35,000,000	10,000,000	1,000,000	46,000,000
1941-42.....	35,000,000	16,000,000	2,000,000	53,000,000
1942-43.....	35,000,000	22,000,000	3,000,000	60,000,000
1943-44.....	30,000,000	28,000,000	4,000,000	62,000,000
1944-45.....	.....	30,000,000	5,544,000	35,544,000
	<u>\$140,000,000</u>	<u>\$113,000,000</u>	<u>\$15,544,000</u>	<u>\$269,044,000</u>

Estimated Federal participation by year and by purpose and total (construction at 80 per cent participation; maintenance and case finding at 50 per cent).

<i>Fiscal Year</i>	<i>Hospital Construction</i>	<i>Hospital Maintenance</i>	<i>Case Finding</i>	<i>Total Six-Year Program</i>
1939-40.....	\$4,000,000	\$3,500,000	\$250,000	\$7,750,000
1940-41.....	28,000,000	5,000,000	500,000	33,500,000
1941-42.....	28,000,000	8,000,000	1,000,000	37,000,000
1942-43.....	28,000,000	11,000,000	1,500,000	40,500,000
1943-44.....	24,000,000	14,000,000	2,000,000	40,000,000
1944-45.....	.....	15,000,000	2,772,000	17,772,000
	<u>\$112,000,000</u>	<u>\$56,500,000</u>	<u>\$8,022,000</u>	<u>\$176,522,000</u>

Such a program of control has been a topic of conversation among experts in the campaign against this disease since the time, 2 years ago, when the late Dr. Wade H. Frost, epidemiologist of Johns Hopkins University, pointed

The program, as outlined, states as its general objective "to reduce tuberculosis throughout the United States in

* Frost, W. H. How Much Control Tuberculosis? *A.J.P.H.*, 27, 8:759 (Aug.), 1937.

the shortest possible time to a negligible factor in morbidity and mortality" and special objectives are to raise to the highest adequacy and efficiency tuberculosis control measures in all sections, and to intensify efforts in the best areas. Experimental demonstrations of case finding among the entire population or selected groups, and more adequate home relief for tuberculosis families, before, during, and after hospitalization of the patient, are suggested as special measures in these areas.

MOST ESSENTIAL MEASURES LISTED

"For the purposes of the program it is assumed that the most essential and immediately effective measures are:

(1) case finding, including X-ray examination, among those who have been exposed to tuberculosis by family contact; (2) provision of hospital care for all cases of tuberculosis discovered needing such care, especially for sputum-positive patients; (3) federal leadership and financial aid, with actual operation generally left to state and local authorities . . ."

In estimating the annual costs of the 6 year program, 1939 to 1945, the report fixes the total at \$269,044,000, including \$140,000,000 for new construction, \$113,000,000 for hospital maintenance, \$15,544,000 for case finding. Maintenance and case-finding costs would not reach the maximum until the 6th year.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH PLAN ALL-DAY MEETING FOR OCTOBER 24

THE Association of Women in Public Health is planning an all-day meeting immediately prior to the Annual Meeting of the American Public Health Association. As president, Sally Lucas Jean, Health Section Secretariat of the World Federation of Education Associations, announces 4 important sessions to be held on October 24. Three of these are scheduled at The Elms Hotel, Excelsior Springs, Mo.; the 4th, an evening banquet, at the Muehlebach Hotel, Kansas City, Mo.

Because Excelsior Springs is enroute to Kansas City for those travelling from the East, many members of the Association and guests are planning to spend the week-end at this famous health resort. Accordingly an informal tea has been scheduled for Sunday afternoon, October 23, to meet the officers of the Association and the committee on local arrangements.

At 9:30 Monday, October 24, the first session will meet in the drawing

room of The Elms Hotel. A series of 10 minute talks on problems and programs affecting the specialists comprising the group will open this session. Women experts in health education, medicine, social hygiene, mental hygiene, maternal care, public health nursing, to mention a few of the interests of the group, will crystallize their ideas in their specific fields before the meeting is thrown open to the entire group.

At 1 p.m., also at The Elms Hotel, an open luncheon meeting will take up the subject of health centers from the angles of the preparation of the worker, rural and urban problems, lay understanding and participation, and the contribution of the various specialists to the problem.

At 3:30 the business meeting will be held to act upon the new constitution upon which the constitution committee has been working for the past year.

At 6:30 the annual banquet will be

held at the Hotel Muehlebach, Kansas City, when three prominent speakers will survey the field from the standpoint of past performance, present program, and future progress through lay support and participation. This banquet meeting will be open to all public health workers, men and women, and their staunch supporters in public health objectives—the public.

Rosamond Losh, executive secretary, Children's Bureau, 1020 McGee Street, Kansas City, Mo., is serving as chairman of the committee on arrangements. The Elms Hotel, Excelsior Springs, has arranged a special over-Sunday rate for those who plan a restful week-end under this roof. Those arriving on Saturday and leaving after luncheon on Monday will be accommodated at a flat rate of \$11.25 per person. This rate includes luncheon and dinner on Saturday, 3 meals on Sunday, breakfast and luncheon on Monday. Guests will occupy double rooms. Therapeutic baths may be arranged for if desired. For those arriving on Sunday evening a rate of \$5.00 will carry through the luncheon on Monday. As golf, horseback riding, tennis, beautiful drives and walks are all available at The Elms no Sunday program of events has been arranged. On October 22 an exhibition of fancy swimming and diving may be observed at the Hall of Waters.

SHELLFISH CONTROL

AQUARANTINE on mussels growing within the area from the southern boundary of Los Angeles County to the Oregon Line, exclusive of San Francisco Bay, has been established by the California State Department of Health.

The quarantine, which will continue through July, August, and September, prohibits the taking, sale or offering for sale of mussels growing within this area.

KANSAS COUNTY HEALTH OFFICERS

THE following County Health Officers have recently been appointed in Kansas:

Dr. Edwin R. Hill, Jr., Lyons—Rice County
 Dr. August A. Meyer, Alma—Wabaunsee County
 Dr. Orlin P. Wood, Marysville—Marshall County
 Dr. Alfred J. Horejsi, Ellsworth—Ellsworth County
 Dr. Benjamin Brunner, Wamego—Pottawatomic County
 Dr. Raymond W. Moore, Eureka—Greenwood County
 Dr. Frank A. Trump, Ottawa—Franklin County
 Dr. Franklin R. Croson, Clay Center—Clay County
 Dr. Benjamin L. Phillips, Paola—Miami County
 Dr. Leon W. Zimmerman, Liberal—Seward County
 Dr. Ivan B. Parker, Hill City—Graham County

The following reappointments have been announced:

Dr. Spencer B. Dykes, Esbon—Jewell County
 Dr. Robert J. Lanning, Junction City—Geary County
 Dr. Donald A. Bitzer, Washington—Washington County

OHIO FEDERATION OFFICERS

NEW officers were elected at the convention of the Ohio Federation of Public Health Officials, April 29, as follows:

President—R. H. Markwith, M.D., Akron
Vice-President—H. H. Pansing, M.D., Dayton
Secretary-Treasurer—W. D. Bishop, M.D., Greenville
Delegate—George D. Lummis, M.D., Middletown

VENEREAL DISEASE CONTROL IN VIRGINIA

ANNOUNCEMENT has been made of a program for the control of venereal disease in Richmond, Va., under the directorship of Dr. Francis W. Upshur, a graduate of the Medical College of Virginia.

PUBLIC HEALTH NURSE PLACEMENT

ON July 1, 1938, the Public Health Nursing Division of Joint Vocational Service, New York, N. Y., was transferred to Nurse Placement Service, 8 South Michigan Avenue, Chicago, Ill. The National Organization for Public Health Nursing approves this placement bureau, and is acting as an intermediary in the transfer of records at the request of registrants.

Elizabeth J. Mackenzie, R.N., Associate Director, Henry Street Visiting Nurse Service, New York, will become Assistant in the development of public health nursing vocational work as a member of the staff of Nurse Placement Service.

Anna L. Tittman, R.N., formerly Vocational Secretary for Public Health Nursing of Joint Vocational Service, is now Executive Director of Nurse Placement Service.

PARROTS BARRED IN NEW YORK

THE New York State Commissioner of Health recently announced that a sanitary code regulation prohibiting the importation, breeding or sale of birds of the psittacine or parrot family became effective June 1. A similar regulation will go into effect in New York City on July 1.

COÖRDINATION IN NEW YORK CITY

A JOINT committee representing the New York City Department of Health and the Board of Education has been established to coördinate problems relating to the welfare of pupils. The Department of Health has jurisdiction over the physicians and nurses, and the Board of Education bureau of health education supervises the general health program.

This is the first permanent committee to be set up to coördinate action on health problems by the two depart-

ments. Chest X-ray examinations for tuberculosis as well as other health undertakings will be made possible with the coöperation of the health department. Advice and counsel to school officers will be provided by the health department, together with medical examination to pupils.

MISSOURI PUBLIC HEALTH ASSOCIATION

THE Missouri Public Health Association held its 14th Annual meeting in Jefferson City on May 13-14, with an attendance of 125 public health workers.

Among the speakers were Governor Lloyd C. Stark, Dr. Thomas Parran and Dr. W. K. Sharp of the U. S. Public Health Service, and Dr. Frances C. Rothert of the U. S. Children's Bureau.

The following officers were elected:

President—Merl P. Moon, Ph.D.

President-Elect—Theodore R. Meyer, M.D.

1st Vice-President—Asa Barnes, M.D.

2nd Vice-President—Raphael Heyburn, R.N.

Treasurer—L. E. Ordeltcheide

Secretary—John W. Williams, Jr., M.D.

STREAM POLLUTION STUDY

PLANS are under way for the construction of a new Public Health Service laboratory in Cincinnati, Ohio, to house the Stream Pollution Investigations Division of the National Institute of Health. The present laboratory, located in the former Marine Hospital building, has carried on work in methods of combating stream pollution for the benefit of waterworks systems throughout the entire country.

VIRGINIA HEALTH UNIT

A NEW full-time health department began functioning in Buchanan County, Va., July 1. Since April 1, 1936, the county's health activities were conducted as a part of a district

composed of Tazewell, Russell, and Buchanan Counties.

Headquarters for the new unit will be in Grundy, Va.

PERSONALS

Central States

DR. OLIVER S. CRAISE, of Towner, N. D., has been appointed Superintendent of the McHenry County Board of Health.

DR. EDMUND STEPHEN DONOHUE, of Gregory, S. D., has been appointed Superintendent of the Gregory County Board of Health.

DR. FRANCIS WELDON FORD, of Minnewaukan, N. D., has been appointed Health Officer of Devils Lake.

DR. RUSSELL R. HANSEN has been appointed Health Officer of Storm Lake, Ia., succeeding DR. EDGAR F. SMITH, who recently resigned after 8 years in the position.

ENOCH M. PORTER, M.D., of Great Falls, Mont., was elected President of the State Board of Health at its recent meeting in Helena.

DR. ARTHUR W. RECORDS has been appointed a member of the Franklin, Ind., Board of Health, to succeed the late DR. DANIEL R. SAUNDERS.

WILLIAM D. STOVALL, M.D.,* Professor of Hygiene, University of Wisconsin Medical School, Madison, Wis., has been appointed acting superintendent of the State of Wisconsin General Hospital, Madison, during the leave of absence of ROBIN C. BUERKI, M.D., to become Director of Study of the Commission on Graduate Medical Education.

ROBERT GILLAM WHITE, M.D.,† formerly of Ann Arbor, Mich., has been appointed to take charge of a new district branch of the North Dakota State Department of Health, with headquarters at Valley City.

Eastern States

JAMES L. BARRON, C.E.,* of White Plains, N. Y., resigned July 1 : Director of the Division of Sanitation of the Westchester County Department of Health. Mr. Barron will become County Sanitary Engineer and will organize a division of sanitation for the Department of Health in Nassau County, N. Y.

DR. FRANCIS BREWER has been appointed Health Officer of Brookfield, Conn.

RUFUS I. COLE, M.D., D.Sc.,† was recently honored at a dinner at the Rockefeller Institute for Medical Research. A bound set of volumes of reprints from the Institute hospital, from which he resigned as Director last year, was presented to Dr. Cole.

DR. WILLIAM L. HIGGINS has been appointed Health Officer of Andover, Conn.

DR. GEORGE S. LAMBERT has been appointed Health Officer of Killingly, Conn.

HARRY B. MELLER,† Managing Director of Air Hygiene Foundation, Pittsburgh, Pa., had the honorary degree of Doctor of Science conferred upon him by the University of Toledo, at the University's 55th annual commencement June 13. He is a Senior Fellow at Mellon Institute and has been in charge of air hygiene researches at that institution for 20 years.

HUGH G. ROWELL, M.D.,† is now associate adviser and associate chairman of the Department of Education of the Handicapped, at Teachers College, Columbia University, and Physician to the Horace Mann School, Teachers College, New York.

DR. JOSEPH L. ROY has been appointed Health Officer of Thompson, Conn.

* Fellow A.P.H.A.

† Member A.P.H.A.

GEORGE C. SHATTUCK, M.D.,† who has been for many years chairman of the executive committee of the Boston Health League, Boston, Mass., has recently become chairman of the Medical Advisory Committee of the Health Commissioner of Boston; chairman of the Advisory Committee for School Hygiene, City of Boston, for the director of the Department of School Hygiene; and president of the Massachusetts Central Health Council.

Southern States

JUSTIN M. ANDREWS, Sc.D.,‡ Associate Professor of Protozoology, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md., has been appointed Director of the Division of Malaria Investigation of the Georgia State Department of Health.

RALPH G. BEACHLEY, M.D.,* Deputy Director of Rural Health in the Virginia State Department of Health, has been appointed Health Officer of Arlington County, to succeed EARLE G. BROWN, M.D.,* who recently became Health Officer of Nassau County, at Mineola, N. Y.

DR. WILLIAM Y. GARRETT, of Raven, Va., has been appointed Health Officer of Prince William County.

GEORGE W. MAST, M.D.,‡ Director of the Holmes County Health Department, Lexington, Miss., has been appointed Director of the Washington County Health Department, Greenville, succeeding JOHN W. SHACKELFORD, M.D., M.P.H.,‡ resigned.

KENNETH F. MAXCY, M.D.,* has resigned as Professor and head of the Department of Bacteriology at Johns Hopkins University School of Hygiene and Public Health, to become Professor and head of the Department of Epidemiology. He re-

tains temporarily his former position as Professor of Bacteriology at the School.

DR. JOHN A. MILNE,‡ of Jackson, Miss., has been appointed Director of County Health Work of the Mississippi State Department of Health, succeeding HENRY C. RICKS, M.D., C.P.H.,‡ resigned.

HENRY C. RICKS, M.D., C.P.H.,‡ for 10 years Director of County Health Work of the Mississippi State Department of Health, Jackson, Miss., was appointed Director of the State Hygienic Laboratory, effective May 1, following the retirement of THEODORE W. KEMMERER, M.S., M.D.,* who has served 14 years as Director. CHARLES L. SAVAGE, M.D.,‡ of Charlottesville, Va., recently Director of the health unit of Tazewell, Russell, and Buchanan Counties, has been appointed Director of the Hanover County health unit, with headquarters in Ashland.

JOHN W. SHACKELFORD, M.D., M.P.H.,‡ of Greenville, Miss., for 8 years Director of the Washington County Health Department, has resigned to become Director of the technical field unit and serve as Advisory Officer for Health Units with the Oklahoma State Department of Health.

ALVIN L. STEBBINS, M.D.,‡ of Punta Gorda, Fla., has been appointed Health Officer of Escambia County, succeeding WILLIAM H. PICKETT, M.D.,* of Pensacola, resigned. Dr. Stebbins has recently been Health Officer of Franklin, Gulf, Liberty, and Calhoun Counties.

RAYMOND A. VONDERLEHR, M.D.,‡ Assistant Surgeon General, U. S. Public Health Service, Washington, D. C., dedicated the new venereal disease clinic to be operated by the Caddo-Shreveport Health Unit, Shreveport.

† Fellow A.P.H.A.
* Member A.P.H.A.

La. Four hundred patients daily will be accommodated in this clinic for syphilis and gonorrhea. This parish consists of approximately 45 per cent Negroes.

Western States

ELMER MCK. BINGHAM, M.D.,† of San Luis Obispo, Calif., Health Officer of Yolo County, has been appointed Health Officer in San Luis Obispo County, succeeding ALLEN F. GILLIHAN, M.D.,* retired due to ill health.

DR. NEIL F. BLACK, of Klamath Falls, Ore., Health Officer of Klamath County, has been appointed State Medical Relief Coördinator.

DR. JOSEPH M. BROWN has been appointed Health Officer of Ferndale, Calif., to succeed DR. OLIVER B. BARRON.

SETH H. MILES, M.D., of Santa Monica, Calif., has been appointed Health Officer of Mono County, succeeding ROBERT K. HARKER, M.D.,† of Bridgeport.

HARRY W. PASLEY has been appointed Health Officer of Reedley, Calif., to succeed DR. ROY E. ALLEN.

DR. ENOCH M. PORTER, of Great Falls, Mont., has been elected President of the Montana State Board of Health, at its recent meeting in Helena.

JOHN O. RAFFETY, M.D.,† of Oakland, Calif., has been appointed Health Officer of Yolo County, succeeding ELMER MCK. BINGHAM, M.D.,†

ROLLO J. SHALE, M.D.,† has been appointed full-time Health Officer of Weld County, Colo., with offices in Greeley. Weld County is the second full-time unit recently established in Colorado.

DR. ELLIS D. SOX, of Berkeley, Calif., has been appointed Health Officer of Tulare County; the unit has recently been placed on a full-time

basis. ELMO R. ZUMWALT, M.D.,† of Tulare, Health Officer of the unit on the former basis, continued as part-time Health Officer until June 1.

Canada

DR. BRABAZON J. HALLOWES has been appointed Health Officer of Alexis Creek, B. C.

DR. DONALD H. WILLIAMS, of Vancouver, B. C., has been appointed Director of the Division of Venereal Disease Control of the Department of Health of British Columbia.

England

DR. ELWIN H. T. NASH, Medical Officer of Health for the Borough of Heston and Ilseworth, has been elected President of the Society of Medical Officers of Health of England for the session 1938-1939.

DEATHS

JOHN N. FORCE, M.D., DR.P.H.,* of the University of California, Berkeley, Calif., recently died suddenly.

JAMES H. FOSTER, of Albany, N. Y., Director of the Child Aid Bureau of the New York State Social Welfare Department, died May 9, after 30 years' service in the state's employ. MARY LUCIER,† died in Rochester, Minn., on July 10.

JOHN J. MULLOWNEY, M.D.,* since 1921 Professor of Public Health, and President of Meharry Medical College, Nashville, Tenn., retired July 1. Dr. Mullowney was Assistant Chief of the Pennsylvania State Department of Health 1913-1917, and head of the Department of Science and Professor of Chemistry and Hygiene, Girard College, Philadelphia, Pa., 1917-1921. His successor is DR. EDWARD L. TURNER.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

- American Association of School Health.
Kansas City, Mo. October 24-28.
- American Association of State Registration Executives. Kansas City, Mo. October 25-28.
- American Dental Association. Hotel Statler, St. Louis, Mo. October 24-28.
- American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9-14.
- American Federation of State, County, and Municipal Employees. Atlanta, Ga. August 29.
- American Hospital Association. Dallas, Tex. September 26-30.
- American Public Health Association — 67th Annual Meeting. Hotels Muehlebach, President, Kansas Citian, Kansas City, Mo. October 25-28.
- American Public Works Association. New York, N. Y. October 3-5.
- American Society of Civil Engineers. Rochester, N. Y. October 12-14.
- American Water Works Association: Central States Section. Hotel Windsor, Wheeling, W. Va. August 17-19.
- Virginia Section. Hotel Robert E. Lee, Lexington, Va. August 25-26.
- Rocky Mountain Section. Townsend Hotel. Casper, Wyo. September 12-13.
- Michigan Section. Bancroft Hotel, Saginaw, Mich. September 14-16.
- New York Section. Nelson House, Poughkeepsie, N. Y. September 22-23.
- Minnesota Section. Minneapolis, Minn. September 29-October 1.
- Wisconsin Section. Milwaukee, Wis. October 10-12.
- Missouri Valley Section. Hotel Fort Des Moines. Des Moines, Ia. October 13-15.
- Southwest Section. Biltmore Hotel, Oklahoma City, Okla. October 17-20.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13-15.
- Association of Women in Public Health — 17th Annual Conference. Excelsior Springs, Mo., October 23-24; Kansas City, Mo., October 24.
- California Association of Dairy and Milk Inspectors. Santa Barbara, Calif. September 6-9.
- California League of Municipalities. Santa Barbara, Calif. September 6-9.
- Conference of State Laboratory Directors. Kansas City, Mo. October 24.
- Conference of State Sanitary Engineers. Kansas City, Mo. October 24.
- Florida Public Health Association. Hollywood, Fla. December.
- International Association for Identification. Columbus, Ohio. August 16-20.
- International Association of Milk Sanitarians. Cleveland, Ohio. October 19-21.
- International Society of Medical Health Officers. Kansas City, Mo. October 24.
- Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13-15.
- Michigan Public Health Association. Lansing, Mich. November 9-11.
- Mississippi Valley Conference on Tuberculosis—25th Annual. Twelve states represented. Hotel Statler, St. Louis, Mo. September 21-24.
- National Dairy Association. Columbus, Ohio. October 8-15.
- National Hospital Association (Negro). Hampton, Va. August 14-16.
- National Institute for Traffic Safety Training. University of Michigan, Ann Arbor, Mich. August 5-20.

- National Medical Association. Hampton, Va. August 15-19.
- National Recreation Association. Pittsburgh, Pa. October 3-7.
- National Safety Council. Chicago, Ill. October 10-14.
- New England Sewage Works Association. (Joint meeting with the New York State Sewage Works Association.) Hotel Bond, Hartford, Conn. October 6-8.
- New Mexico Public Health Association. Las Vegas, N. M. October 31, November 1-2.
- New York State Sewage Works Association—Fall Meeting (joint meeting with New England Sewage Works Association). Hotel Bond, Hartford, Conn. October 6-8.
- Northern California Public Health Association. January, 1939.
- Southern Branch, American Public Health Association—7th Annual Meeting; and Southern Medical Association. Oklahoma City, Okla. November 15-16, 1938.
- Symposium on Mental Health. Auspices of the American Association for the Advancement of Science—Section on Medical Sciences. Richmond, Va. December 27-31.
- Texas Public Health Association. San Antonio, Tex. November 7-9.
- Third International Congress for Microbiology. Waldorf-Astoria Hotel, New York, N. Y. September 2-9, 1939.
- U. S. Public Health Service—Committee on Evaluation of Serodiagnostic Tests for Syphilis, Surgeon General Thomas Parran, Chairman. Assembly of Laboratory Directors and Serologists. Hot Springs National Park, Ark. October 21-22.
- International Congress on Housing and Town Planning. Mexico City, Mexico. August 13-20.
- Sixteenth International Physiological Congress. Zurich, Switzerland. August 14-18.
- British Association for the Advancement of Science. Cambridge, England. August 17-24.
- International Veterinary Congress—Thirteenth. Zurich and Interlaken, Switzerland. August 20-27.
- Medical Association of South Africa—Annual Medical Congress. Lourenço Marques (near Delagoa Bay, seaport resort), Port E. Africa. September.
- International Congress for the History of Medicine, Ninth. Zagreb, Yugoslavia. September 3-11.
- Pan American Sanitary Conference, Tenth. (Last Conference was held in Buenos Aires, 1934.) Bogota, Colombia. September 4-18.
- Special International Conference on Sewage Works and Disposal. Glasgow, Scotland. September 12-18.
- Third United International Congress of Tropical Medicine and Malaria. Amsterdam, The Netherlands. September 24-October 1.
- French Medical Congress—25th Annual. Marseilles, France. September 26-28.
- Eighth International Congress of Industrial Accidents and Occupational Diseases. Frankfurt-am-Main, Germany, September 26-30.
- French Pediatric Congress—10th Annual Meeting. Medical Amphitheatre, Children's Hospital, Paris, France. October 6-8.
- Conference on Rural Hygiene in American Countries. Mexico City, Mexico. November 10.
- Pan-American Congress of Municipalities. Havana, Cuba. November 14-19.

FOREIGN

- International Meeting for Cell Research. Anatomical Institute, Zurich, Switzerland. August 7-13.

American Journal of Public Health

and THE NATION'S HEALTH

Volume 28

September, 1938

Number 9

Health Hazards in the Dry Cleaning Industry

A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area

WILLIAM H. CARY, JR., C.E., F.A.P.H.A., AND
JOHN M. HEPLER, C.E.

*Former Sanitary Engineer, Bureau of Industrial Hygiene, Department
of Health, Detroit, Mich.; and Director, Bureau of Industrial
Hygiene, State Department of Health, Lansing, Mich.*

THE chief purpose of this investigation has been to determine the working conditions in the dry cleaning industry, with emphasis on its outstanding health hazards. In order to obtain a true picture of the industry as it serves a large and concentrated population and in order to eliminate those variables which ordinances or regulations might impose within the city limits, the survey was extended to the Detroit metropolitan area. Since plants coming under the jurisdiction of both the Michigan and the Detroit Departments of Health were involved in the survey, their respective Bureaus of Industrial Hygiene coöperated in the field work and the preparation of this report.

The area covered includes all of the incorporated municipalities adjacent to and contributing to the life of the City of Detroit and certain well populated unincorporated areas. Not included

are largely open agricultural sections devoted to farming and truck gardening.

From departments which license such establishments and from fire chiefs and other public officials, an original list of dry cleaning establishments was created. This list was supplemented from other sources, such as telephone directories and classified advertising, until not only all plants actually doing cleaning were located and inspected but all "pick-up" stations as well were visited to make sure that cleaning on a small scale was not being overlooked.

The investigation may be termed a preliminary engineering survey to determine the types of equipment and kinds of solvents used, number of employees involved, existing and potential health hazards, control measures provided, and the medical or first aid requirements needed or provided. Some qualitative and quantitative measure-

ments of the concentration of vapors and gases present in the establishments were made, but no attempt at determining the physical condition of the individual employee was undertaken.

TRADE PRACTICES

The dry cleaning industry has been subject to continuous innovation. In the beginning, dry cleaning was accomplished merely by dipping. The solvent, originally gasoline or an equivalent, was merely placed in a tub, and in this was submerged the garment to be cleaned. Repeated explosions and fires quickly demonstrated the danger of this practice.

The original tub dipping has almost entirely disappeared. Primitive methods have given way to enclosed or partly closed systems. In some, at least, of the highly developed devices, cleaning and drying take place in one operation without the necessity of opening the container, and thus without introducing a high concentration of vapors into the work room. The shift from the completely open system using tubs or vats to the semi-closed or completely closed systems has been brought about primarily by legal or economic pressure. Fire and explosion hazards have rightly led to regulations in most cities and states. Upon the introduction of non-flammable solvents, it was found that wastage through evaporation in the open systems made the use of these more costly agents uneconomical. As a consequence, in late years there has been a definite trend toward closed systems. If the worker, through the operation of closed systems, is less exposed to the evaporation of solvents, and if these devices obviate the necessity of hand contact with these damaging agents, it manifestly follows that the workers are less likely to be injured through the inhalation of poisonous vapors or to acquire skin diseases through contact with cleaning liquids.

Experience with closed systems tends to emphasize the dangers from dry cleaning processes carried out in completely open systems and in those semi-closed systems which still provide opportunities for the creation of dangerous quantities of vapors and for skin contact with the substances employed.

All considered, it is necessary to recognize that many health hazards are widely prevalent in the dry cleaning industry; that legal restrictions adequate to the situation have not been provided in many localities; and that advantages have been taken with respect to the many opportunities for the evasion of such legal provisions as have been instituted. Moreover, it is apparent that health officials have not been fully cognizant of the extent of the dangers that, at least theoretically, and to some extent practically, reside in the trade practices attending dry cleaning.

Few commercial dry cleaners limit themselves to one place of business. Many dry cleaning establishments maintain central plants, and in addition scores of stations without any facilities for actual dry cleaning, which serve primarily as intake or delivery points. In some instances, these "pick-up" stations are owned and operated by the management of the central plant, but for the most part, they are privately owned and served by the central plant on a wholesale basis. In addition to the "pick-up" stations, the industry employs a large number of salesmen or drivers. These men usually cover a prescribed territory and are employed on a salary plus or straight commission basis. The operation of stations for pick-up and delivery work provides opportunities for the location of the actual dry cleaning plants outside city limits. This may introduce occasion for avoidance of compliance with local regulations.

Dry cleaning is commonly associated with garments such as suits and dresses.

While these articles do make up the great majority of fabrics subjected to cleaning, a fair amount of dry cleaning is extended to carpets, rugs, hats, leather goods, fur and animal hair products. However, the fundamental practices are substantially the same in all branches of the industry. Typical high grade practices are now described.

When the garments reach the dry cleaning plant, they are marked for identification. They are next searched and all articles removed from the pockets. As a first step in the actual cleaning, all cuffs and seams are brushed, after which the clothing is placed in the washer. Modern practice requires that the garments be washed until the solvent being circulated through the machine comes from the washer clear and free from turbidity. All during the washing process, the solvent is being passed through a "closed" system, from the washer to a filter or other cleansing unit and back into the washer. Sight glasses on the influent and effluent lines give the cleaner ample opportunity for careful observation of the progress of each wash.

In closed systems, the garments are extracted and dried in the washer itself. After the cleansing is complete, the solvent is drawn off, the washer speeded up in order that the major portion of the solvent in the garments may be removed by centrifugal force. Following this, quantities of hot air are passed through the machine. As an economy measure, where halogenated hydrocarbons are used as cleaning fluids, an attempt is usually made to recover the solvent from the discharged air. This is done by the use of refrigeration, cold water coils or activated carbon filters. Theoretically at least, garments come from such systems entirely free from any traces of solvents. Practically, this was not found to be so.

In other installations, the garments

are removed from the washer by hand and placed in a centrifuge extractor. After being extracted as dry as possible in this machine, they are placed in a tumbler. The tumbler consists of a rotating cylinder through which hot air is passed until the garments are dried. The exhaust from the tumblers is generally discharged directly into the atmosphere outside the building.

About 10 per cent of the garments that are dry cleaned require spotting. The spotter, who is a real artist in his work, must diagnose the cause of each spot or stain, since different cleaning agents are needed, according to the cause of each. After the spots have been removed, the garments rejoin the other 90 per cent for the final operation of pressing. Steam presses are generally used, and the operation is a familiar one, known to all who have occasion to visit tailoring and pressing shops.

For garments of delicate texture, different handling is needed. The types of washers vary somewhat from the standard rotary washer and the drying process varies from that already described. The latter is accomplished by hanging the garments in a special room or chamber into which hot air is forced. The final step of pressing is hand work instead of steam press work as with the heavier garments.

Naturally, the processes just described do not apply to all systems of dry cleaning. There are extremes beyond and modifications between all the methods listed.

QUALITIES DESIRED IN A SOLVENT

A solvent, in order to be suitable for dry cleaning processes, must have several important properties.

1. It must be cheap and readily available.
2. It must be a reasonably good solvent for greases and body waste products.
3. It must be inert to the fabrics to be cleaned in it and to the dyes as well.

4. It must lend itself to some purification processes for reclamation purposes when it becomes dirty.

5. It must be sufficiently volatile in order that its complete removal from cleaned fabrics may be rapidly accomplished without objectionable residual odors.

6. It must have a high flash point in order to reduce explosion and fire risks.

7. It must be dry (containing no water and having no alcoholic properties).

8. Lastly, but of prime consideration, it must possess a low order of toxicity.

In the earlier days of dry cleaning, benzine (gasoline) was used. The danger of explosion and the fire hazard early resulted in its replacement by cleaners' naphtha (boiling point 200°F.-325°F., flash point approximately 25°F.), a petroleum fraction. Frequent explosions and fires, resulting in damaged goods and high insurance rates, led to the introduction of Stoddard's solvent, a petroleum fraction (maximum boiling point 410°F., flash point 104°F.). While this solvent possesses low toxic properties, fire insurance regulations permit its use only under certain definite and sometimes inconvenient conditions. For years the use of a non-flammable solvent has been recognized as desirable, but the only commercially available ones, carbon tetrachloride and chloroform, were too expensive for wide use. With the introduction of cracked petroleum and the subsequent utilization of the unsaturated gaseous by-products, many new halogenated solvents became available. All met the requirements of a dry cleaning solvent very well and many of them are just now being introduced to the industry. Recently, to avoid the embarrassment of fire regulations, a new petroleum fraction, F-140 (flash point 140°F.), has been introduced but is still in the developmental stage.

The following list includes the chief solvents which are available for use either individually or in combination with one another.

Benzol (C_6H_6)	Dichlorethylene
Petroleum naphtha	Trichlorethylene
Stoddard's solvent	1,1,1-trichlorethane
Gasoline	1,1,2-trichlorethane
F-140	1,1,1,2-tetrachlorethane
Carbon tetrachloride	Ethylene dichloride

CHEMISTRY OF SOLVENTS IN COMMON USE

In general, petroleum fractions are very stable and enter into chemical reactions only with unusually reactive agents or under extreme conditions of temperature and pressure. Unquestionably the presence of small amounts of impurities in the solvents as a result of the process of manufacturing may be of consequence, but the usual method of treating solvents in the dry cleaning plant is well designed to remove such impurities. In the routine use of the solvent with the addition of many kinds of detergents and the accumulation of body waste, dirt and the like, it probably picks up impurities of a nature harmful to the cleaner. If an adequate reclamation system is in use in the plant, no danger should arise. These facts emphasize the need for satisfactory purification systems.

When the halogenated hydrocarbons or the so-called synthetic solvents are considered, the situation is quite different. These solvents as a class are relatively active. In the presence of alkalis, they tend to split off chlorine with the formation of alkali chlorides; in the presence of water they tend to hydrolyze with the formation of hydrogen chloride or hydrochloric acid depending upon the amount of water present. The compounds are susceptible of rather easy oxidation so that in the presence of atmospheric oxygen, certain decomposition compounds may be formed. Halogenated solvent vapor, when exposed to light and atmospheric oxygen, or elevated temperatures such as are produced on contact with hot steam pipes, may become oxidized with the formation of carbonyl chloride

(phosgene) and chlorine. The well known toxicity of phosgene possibly may, in some instances, enter into the totality of exposures connected with halogenated hydrocarbon vapors. Due to these chemical changes, it becomes apparent that if halogenated hydrocarbons are to be used for dry cleaning solvents, they should be used in completely closed systems, no chemicals which promote their decomposition should be added, and no high temperatures should be employed if atmospheric oxygen is present.

Furthermore, special care should be taken in the selection of materials for use in the construction of machinery, if the metal of that machinery is to come into contact with the solvent, lest the metal activate undesirable decomposition. The intelligent and proper use of halogenated solvents in the dry cleaning industry or in any other industry cannot be too highly emphasized.

SPOTTING AGENTS

Spotting is an art requiring long experience and good judgment on the part of the spotter. Each one will have certain chemicals or mixtures which he believes to be most effective on a type of spot or stain. For this reason, it is not easy to compile a list of chemicals which may be found at any individual spotting board, but one may compile a list of chemicals which might be encountered in an inspection of a number of dry cleaning plants. While many chemicals are used in spotting processes, most spots are removed with water, dilute acetic acid, or dilute ammonium hydroxide. The following list includes most of the chemicals which are used either alone or in combination for spotting processes.

MOTH-PROOFING

Many attempts have been made to apply moth-proofing materials to garments in the dry cleaning plant. Older

SPOTTING AGENTS

Acetic acid	Isopropyl alcohol
Acetone	Lactic acid
Ammonium hydroxide	Lysol
Amyl acetate	Magnesium carbonate
Amyl alcohol	Methanol
Benzene	Oleic acid
Butylcellosolve	Oxalic acid
Borax	Potassium
Carbon disulphide	permanganate
Carbon tetrachloride	Pyridine
Castor oil	Rapid acting enzymes
Chloride of lime (calcium chloro-hypochlorite)	for albumen, etc.
Chloroform	Sodium cyanide (rare)
Citric acid	Sodium hydrosulphite
Cresylic acid	Sodium chloride
Diethyl ether	Sodium lauryl sulphonate
Dry-cleaning soap	Sodium perborate
Ethyl acetate	Sodium sulphite
Ethyl alcohol denatured with methanol	Sodium thiosulphite
Ethylene dichloride	Sulphonated oils
Ethylene glycol	Sulphurous acid
Glycerine (Glycerol)	Tetrachlorethane
Hydrofluoric acid	Tetralin
Hydrochloric acid	Trichlorethylene
Hydrogen peroxide	Tri-sodium phosphate
Hexolin	Triethanolamine
	Water
	Xylene

methods involve spraying the garments with arsenic compounds, which, although they give adequate protection to the garments, exposed both the workers and the wearers of the garments to the dangers of arsenic poisoning. Furthermore, spraying of the individual garments greatly increased the cost of handling. Inasmuch as moth-proofing was usually offered as a free service, it was not profitable to conduct the operation. Recently various moth-proofing preparations have appeared which are added directly to the solvent, from which they are preferentially absorbed by the clothes. Obviously, this method of moth-proofing is economically practical since it involves no additional labor for its accomplishment. Inasmuch as the cost of the preparations is not great, the cost of the treatment is not only negligible, but yields good returns in advertising value. Such preparations

are expected to come into general use within the next few years.

No information is available as to the exact ingredients of these preparations since in every case the manufacturer is keeping the formula secret. As far as is known, no reliable data are available as to their toxicity to man.

A survey of patent literature and other sources shows that many chemicals have been proposed for this purpose. The following list includes some of these materials:

INGREDIENTS OF MOTH-PROOFING PREPARATIONS

1. The condensation products of Isatin-5-sulphonic acid with amyl cresol (acid condensing agent)
2. The condensation products of Isatin-5-sulphonic acid with p-tert-amyl phenol (acid condensing agent)
3. The condensation products of N-benzylisatin sulphonic acid with thymol (in presence of stannic chloride, SnCl_4)
4. Sodium aluminum silica fluoride
5. Chloroxylenols (mixed)
6. Trinitro-isobutyl-xylene
7. Sodium fluoride
8. Sodium taurocholate
9. p-nitro-chlorobenzene
10. Dichlorobenzene
11. Fluoro-derivatives of naphthalene, biphenyl, aniline, phenol, acetic acid and methane
12. 1,2,3,4-tetrahydronaphthalene
13. 3,4 - dichlorobenzenesulphomethylamide and diethylbutylglycolphosphate
14. 3,4 - dichlorobenzenesulphodiethylamide and tri-isoamylphosphate
15. 3,4-dichlorobenzenesulphobutylamide and tritolylphosphate
16. 90% propylene dichloride and 10% carbon tetrachloride
17. Sodium arsenite solutions
18. Solvent naphtha or diphenyl methane, diphenylethane or biphenyl
19. 1,3-dichlorobenzene-4-sulpho-1, 3-phenylene-diamine plus diethylbutylglycol phosphate
20. Sodium 3',5', 4"-pentachloro 2,2'-dimethoxytriphenyl methane - 2" - sulphonic acid. Other substituted triaryl methanes may be used.
21. p-dichlorobenzene
22. Naphthalene

It is expected that in the near future many dry cleaners will have some kind of vault-type moth-proof storage avail-

able. The most familiar is cold storage, the cold being provided by artificial refrigeration usually employing sulphur dioxide, methyl chloride, or carbon dioxide as a refrigerating gas, since ammonia machines are too expensive to operate on such small installations. This type of storage introduces the dangers of commercial refrigeration to the industry.

Another popular type of moth-proofing storage is that recommended by the U. S. Bureau of Standards. This method involves the storage of clothes in an atmosphere the humidity of which is properly controlled and the temperature of which is permitted to vary through a certain specified range. An advantage of this system lies in the fact that moth larvae are actually killed in this environment.

A third method involves fumigation of the clothes with some type of gas toxic to the moths and their larvae. Formerly hydrogen cyanide was commonly used for this purpose. At the present time a new gas, "malium," is being widely used. These three types of storage may be used individually or in some combination with one another.

It is impossible at the present time to evaluate the hazards which this new phase of the dry cleaning industry has introduced.

RETEXTURING

In the manufacture of textiles, especially woolen and silk materials, an important part of the process consists in adding some type of oil or lubricant to the fabric. The presence of such oils improves the sheen and texture, increases the wearing quality, and makes the fabric water-repellent. Unfortunately, dry cleaning effectively removes these oils or lubricants from the fabrics with the result that a frequently dry cleaned garment becomes dull in appearance and tends to wear out quickly due to the friction of

unlubricated fibers on one another. Recently, attempts have been made to remedy this condition. The problem of retexturing is still in the research and developmental state, but its use even now is beginning to appear in a few dry cleaning plants and it is safe to predict that within the next few years retexturing will become as important a part of the dry cleaning process as pressing the clean garment. The retexturing agent must be completely absorbed by the fiber itself without leaving an external greasy film. Paraffin wax, dibutyl phthalate, aluminum stearate, diglycololeate and glycolboriborate, chlorinated derivatives of naphthalene, anthracene, biphenyl ether and various sulphonated oils may be used and, in some instances, are being used as lustering and retexturing agents. Inasmuch as virtually nothing is known concerning the toxicity of these substances, it is not possible to appraise these hazards, but only to suggest that the toxicity of these materials must be investigated at some time in the near future.

RECLAMATION OF SOLVENTS

In the course of ordinary use the dry cleaning solvents become contaminated with grease, mechanical dirt, dye, unsaturated compounds, waste products of the body, and various soaps and detergents used as cleaning agents. Reclamation processes fall definitely into two groups, chemical and physical. Both may be applied to the stable petroleum fractions, but only physical methods may be used for halogenated solvents owing to their inherent instability.

Two chemical methods are in common use. One is the so-called "continuous" caustic settling system in which process the solvent to be reclaimed is bubbled through a strong potassium hydroxide solution in a large tank. Separation of the solvent from the chemical is effected by gravity.

The waste sludge is periodically withdrawn from the tank, which is then recharged with fresh caustic solution.

The second method, which is distinctly superior in effectiveness, is a so-called "batch" process. A convenient volume of solvent and a proportionate volume of concentrated commercial sulphuric acid are placed in a special tank and the whole thoroughly mixed. The concentrated acid is used to prevent the decomposition of the steel tank and pipes. This treatment renders most of the impurities water soluble. The batch is then thoroughly washed with water until the wash water is neutral. A small amount of concentrated potassium hydroxide is added, mixed, and washed out with water until neutral. The solvent is now considered ready for use.

Several physical methods are available, the most effective of which is that of distillation. This is usually done with a large capacity vacuum still of the continuous type. About once a week depending upon the condition of the solvent, the still must be opened and cleaned out. This is usually a hazardous task, as the operator is exposed to an accumulation of waste material and to a high concentration of organic vapor.

The next most generally used method, frequently used concurrently with distillation, is that of continuous pressure filtration. While several types of filters are used, they all utilize the principle of circulating the solvent through a filter medium supported either on a bag or on a monel metal screen. Filter powder is added directly to the solvent. Some common powders are Filteraid, Fuller's Earth, diatomaceous earth, diatomaceous silica, activated silica, or activated alumina. A further treatment frequently utilized with continuous filter systems involves the addition of a finely powdered activated carbon to the solvent. This preferentially absorbs unsat-

urated hydrocarbons, body wastes, and pigmenting substances from the solution.

Another physical purification method now virtually obsolete involves purely mechanical centrifugal clarification. The dirty solvent is passed through a centrifugal machine similar to a cream separator, thus removing, mechanically, particles from the solution. Obviously this method of treatment will not remove dissolved impurities.

In modern dry cleaning plants reclamation is accomplished by a combination of distillation, continuous pressure filtration, and activated carbon. Needless to say, only this type of procedure is available for the reclamation of halogenated organic solvents.

HOME DRY CLEANING

Since the principal cost of dry cleaning arises in the finishing and delivery of the garments rather than in their actual cleaning, a considerable apparent saving can be effected by conducting dry cleaning at home thus avoiding the latter charges.

Such dry cleaning operations are usually conducted by the housewife in the basement or kitchen of the home. The clothes are washed in an open vessel containing cleaner's naphtha, which may be purchased at popular prices at almost any filling station. This material is flammable and its vapors may be readily ignited by static sparks produced by friction of silk garments upon one another, open flames, hot stoves, faulty electrical connections, washing machine and vacuum cleaner motors, electric irons, toasters and other household electrical appliances. Even such a simple operation as turning off or on an electric light may provide the necessary spark. As a result, serious accidents arising from home dry cleaning operations are common. This danger may be minimized to a certain extent by working out of doors on a rainy day when the humidity is high. This

avoids the accumulation of high vapor concentrations in confined places and reduces the danger from static sparks. This latter danger is especially high on a clear winter day and in any heated house.

To eliminate the fire hazard, so-called fire-proof or safety solvents have been introduced. These solvents consist of cleaner's naphtha, with enough chlorinated hydrocarbon solvent, such as carbon tetrachloride, added to raise the flash point beyond the danger zone. Unfortunately the vapors of such solvents are much more toxic than those of cleaner's naphtha due to the presence of chlorinated compounds. The only end gained is the replacement of a fire hazard with an almost equally serious health hazard. The use of a comparatively non-flammable petroleum fraction such as Stoddard's solvent is not feasible, due to the difficulty of driving the residual solvent and odor from the fabric without the use of heat.

When all aspects of the situation are taken into consideration, it is very doubtful if dry cleaning at home affords to the housewife a real economy since the great fire and health hazards combined with the definitely inferior cleaning clearly offset the few dollars a year saved. In most instances, careful selection of fabrics at the time of purchase, accompanied by properly conducted wet-wash methods will produce results superior to home dry cleaning and at no risk to the housewife. Under few, if any, circumstances, can dry cleaning at home be considered a wise practice.

SOAPS AND DETERGENTS

Successful dry cleaning with petroleum solvents cannot be accomplished unless some emulsifying agent or water bearing agent is added to the solvent. Such additions are necessary in order to keep mechanical dirt in suspension in the solvent until it may be removed by a filter or some other process and

to permit a certain amount of solution of materials which are insoluble in organic solvents. These agents fall into 4 classes:

1. Aqueous agents such as ammonium hydroxide and alcohol. Many cleaners add large quantities of ammonium hydroxide to the solvent, sufficient, in fact, to give it a strong ammoniacal odor.

2. Soaps—The soaps are the most important class. In order that they may be reasonably soluble in the solvent, one of the potash salts of the various fatty acids must be used. The most commonly used are the potash salts of oleic, palmitic, and stearic acids. Many of these soaps are either insufficiently soluble or their emulsions are of such large particle size that their salts will not pass through a pressure filter such as is used by the industry without their partial or complete removal from the solvents. Hence, special "filter" soaps are necessary for use in filter systems and differ from other soaps largely in that special emulsifying agents have been added which greatly reduce the particle size of the soap suspension.

3. Aqueous solutions of such materials are sodium carbonate, borax, trisodium phosphate, and the like.

4. Emulsifying agents such as sulphonated oils, sulphonated long chain alcohols, esters such as diglyco-oleate and hydrogenated aromatic compounds (for instance tetralin and hexalin).

The present trend in detergents is definitely toward the sulphonated oils, for example, sulphonated cocoanut oil, sulphonated palm oil, sulphonated fish oils.

In order to give a picture of the chemical composition of some typical soaps and other detergents, a few formulae are included.

In general, the potassium salts of stearic, palmitic, and oleic acids, the triethanolamine salts of fatty acids,

Formula No. 1

	Parts
Oleic acid	1
Cyclohexanol	1
Carbon tetrachloride	1
Ammonium hydroxide (26 be)	0.2
Water	0.5

Formula No. 2

	Parts
Oleic acid	107
Butylcellosolve *	27
Cleaner's naphtha	25
Triethanolamine	19.7
Potassium hydroxide	8.3
Water	13.5

* Isopropyl alcohol may be substituted as a coupling agent.

sulphonated oils, sulphonated alcohols, long chain alcohols such as cetyl alcohol, ethylene glycol esters of fatty acids and aqueous solutions of ammonia, alcohol, trisodium phosphate, sodium carbonate, and the like are used.

"PICK-UP" STATIONS

In addition to the 97 plants investigated, 828 "pick-up" stations were visited during the course of this survey. No attempt was made to list their employees, but several points of interest were investigated. It was first determined whether any dry cleaning was actually carried on at the premises or whether it was all sent to an established plant. A number of small plants that

TABLE I

General Classification of Plants, Employees, and "Pick-Up" Stations

	Number of Plants			
	Metro- politan Detroit Area	Total	Per cent	Total
Number of Plants				
Total	74	23	97	100
Petroleum Solvents	57	13	70	72.2
Synthetic Solvents	17	10	27	27.8
Number of Employees				
Total	2,033	541	2,574	100
Men	1,108	319	1,427	55.5
Women	925	222	1,147	44.5
Number of "Pick-Up Stations"				
Total	754	74	828	100
Dry Cleaning	615	63	678	81.9

TABLE II
Distribution of Inside Employees

	<i>Detroit</i>		<i>Metropolitan Area</i>		<i>Total</i>		<i>Grand Total</i>
	<i>M.</i>	<i>F.</i>	<i>M.</i>	<i>F.</i>	<i>M.</i>	<i>F.</i>	
Administrative	113	155	28	41	141	196	337
Managers	92	1	25	..	117	1	
Clerks	21	154	3	41	24	195	
Assembly and Inspection	112	135	23	27	135	162	297
Shippers and Receivers	97	129	22	25	119	154	
Helpers	8	6	1	2	9	8	
Foremen	7	...	..	..	7	...	
Maintenance	11	2	5	2	16	4	20
Janitors	5	...	..	..	5	...	
Maintenance	1	...	3	..	4	...	
Repair	5	2	2	2	7	4	
Boiler Operation	25	...	5	..	30	...	30
Firemen	14	...	3	..	17	...	
Watchmen	11	...	2	..	13	...	
Dry Cleaning	110	...	34	..	144	...	144
Cleaners and Helpers	110	...	34	..	144	...	
Wet Cleaning	54	1	18	..	72	1	73
Rough Spotters	29	1	13	..	42	1	
Steam Cleaners	21	...	4	..	25	...	
Washmen	4	...	1	..	5	...	
Finishing	270	481	61	92	331	573	904
Finishers	...	2	..	..	...	2	
Pressers—Fancy	...	325	..	67	...	392	
Pressers—Steam	270	154	61	25	331	179	
Spotting	51	36	21	7	72	43	115
Paint Scratchers	1	..	..	..	1	...	
Spotters—Fancy	50	36	21	7	71	43	
Tailoring	32	107	12	53	44	160	204
Tailors	26	12	8	10	34	22	
Seamstresses	5	94	3	43	8	137	
Others	1	1	1	..	2	1	
Hatters	8	8	1	..	9	8	17
Total Inside Employees	786	925	208	222	994	1,147	2,141

would have been overlooked otherwise were found in this manner. Whether steam pressing was done on the premises was also determined. Where steam presses were used, an inquiry was made as to the type of steam generator, and whether this boiler was furnished with a proper flue or fume pipe.

These stations furnish approximately 700 additional persons who are exposed

TABLE III
Number of Employees

<i>Number of Employees</i>	<i>Metropolitan Area</i>			<i>Per cent of Grand Total</i>
	<i>Detroit</i>	<i>Area</i>	<i>Total</i>	
10 or less	33	11	44	45.3
11- 25	17	5	22	22.7
26- 50	13	5	18	18.6
51-100	8	1	9	9.3
Over 100	3	1	4	4.1
Totals	74	23	97	100.0

to high temperatures from steam. In addition, some of these pressers are exposed to carbon monoxide fumes because of no fume pipe or an improper fume pipe on the steam boilers, or defective boilers. Although this survey was conducted in the summer and early fall when doors and windows were generally wide open, fumes from the burners were noticeable in many stations. This was particularly true in the case of the small oil burning type.

LEGISLATION

For years, many cities and states have enforced ordinances or regulations for the construction of dry cleaning plants and for the conduct of the industry. At the time most of these ordinances or regulations were enacted, naphtha and gasoline were almost universally used as the solvents, and as a consequence extreme fire hazards existed. Legislation, therefore, was designed to reduce the fire hazard in the plant and to adjoining property. Little or no concern was given to any health hazard which might be present. With the introduction of synthetic solvents possessing no fire hazards, plant owners saw an opportunity of getting away from such regulations and of conducting their businesses in existing structures.

With few exceptions, state laws and local ordinances define the industry; regulate the type of building and location in which it may be conducted; describe in some detail the heating, lighting, and ventilation of said buildings; indicate within limits the construction of the equipment that may be used; and stipulate the conditions governing the storage, handling, refinement, and use of the solvents. Little more could be asked if such laws included protection for the health of the workers. There are two important shortcomings in our present laws. In defin-

ing the industry, only those enterprises employing a solvent of a flammable or explosive nature are usually included. Further, with rare exception, the regulations are designed not entirely to rid the atmosphere of solvent vapors but merely to keep the concentration of such vapors below the explosive range. Since the synthetic solvents used in the industry are classed as non-flammable and non-explosive, most existing regulations or laws do not govern their use.

Notice is taken that some few states, such as Ohio, have provided codes limiting the use of chlorinated hydrocarbons to closed systems.

TOXICITY AND CLINICAL MANIFESTATIONS

Because of space limitation, all reference to physiologic properties of solvents, clinical manifestations, frequency of cases, and methods of diagnosis are omitted. Discussions of this character may readily be found in the publications of the Smyths, Hayhurst, McCord, Smith, Lamson, Wirtzschafter, and many others.

Of greater importance for the present presentation, is the bringing to light of scores of substances widely used in the dry cleaning industry which are little known to industrial hygienists, at least under the circumstances attending dry cleaning work. At the present time, appraisal of these little known substances in terms of toxic properties constitutes a greater need than further elaboration upon the properties of better known solvents.

Apart from the exposures that may grow out of the large number of agents directly used in cleaning work, and the reclamation of cleaning materials, a few other hazards, chiefly of physical nature, have been encountered. The outstanding ones are now briefly mentioned.

Excessive Temperature—The steam press operators are subjected to the heat from presses. This condition is particularly bad in places where the presses are not equipped with motor driven vacuum exhausts. To a lesser extent, hand pressers using electric hand irons are also subject to some high temperatures. In Table IV showing numbers exposed to various hazards, this latter group is not included as exposed to excessive temperatures.

TABLE IV
Employee Exposure

<i>Exposure</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
Solvents			
Naphtha	17	0	17
Gasoline	1	0	1
Stoddard's Solvent	191	0	191
F-140	4	0	4
Chlorinated Solvents	67	27	94
Spotting Fluids	202	52	254
Heat (Steam Pressing)	458	326	784
Moisture (Steam Cleaning)	47	0	47
Tenovitis	0	377	377
Posture	340	191	531
Carbon Monoxide	98	0	98
Total	1,425	973	2,398

Posture—The steam press operators are also subject to the hazards of posture. In operating the presses they are required to use both feet as well as their hands.

Excessive Moisture—The steam cleaners are the persons who do the wet washing and work generally under poor conditions. With their scrub brush and board they are usually located in the basement or in some out of the way corner of the building. The very nature of their occupation subjects them to constant wetting and only by the use of rubber boots and aprons are they able to keep even a semblance of dryness.

Tenovitis—The hand pressers are subject to a possible inflammation of the cords in the backs of their hands from the constant lifting and pressure on the irons.

Carbon Monoxide — Firemen and boiler operators are at least theoretic-

cally, if not practically, subject to carbon monoxide poisoning.

INSTRUMENTATION

In the conduct of this survey, three procedures chiefly have been utilized in the determination of the concentration of vapors present:

1. A combustible gas indicator, of special design, permitting of the measurement of gases and vapors in toxic as well as explosive ranges.

2. A halogen lamp, which chiefly affords qualitative information. This was particularly useful in tracing the spread of toxic chlorinated hydrocarbon vapors emanating from known points.

3. The quantitative determination of chlorinated hydrocarbon vapors through activated charcoal absorption.

SUMMARY

This report embraces the findings of an engineering investigation of the dry cleaning industry in the City of Detroit and its environs. Ninety-seven dry cleaning plants were investigated, together with 828 "pick-up" stations. This is a progress report, which, in many phases, especially with respect to medical and analytical data, is incomplete. From information now on hand it appears:

1. The total number of dangerous substances used in dry cleaning and ancillary operations is far in excess of the small number customarily associated with the dry cleaning industry. Scores of agents have some use

TABLE V
Safety and Medical Provisions

<i>Items</i>	<i>Detroit</i>	<i>Michigan</i>	<i>Total</i>
No. of Plants	74	23	97
No. of Employees	2,033	541	2,574
Safety Provisions			
Safety Director, Part Time	1	2	3
Safety Committee	0	1	1
Compensation Insurance	41	13	54
Other Forms Insurance	17	3	20
Medical Provisions			
First Aid Room	3	0	3
First Aid Kit	55	13	68
Trained First Aid Worker	3	2	5
Nurse	1	0	1
Sick Benefit Association	2	0	2
Sickness Records Available	1	6	7
Accident Records Available	32	9	41

which so far as is known have never been adequately investigated in connection with possible toxic properties.

2. In every instance of the use of chlorinated solvents or mixtures of chlorinated solvents with petroleum fractions as primary dry cleaning fluids, a definite exposure was found to exist. If these solvents are to be safely used in this industry, an extensive revision of current operating practices is in order.

3. With few exceptions, the use of Stoddard's Specification Solvent probably presents a minimum of hazard arising from the inhalation of vapors.

4. In most instances where very volatile petroleum fractions such as cleaner's naphtha and gasoline were used, unsafe concentrations of the vapors of these solvents were found to exist.

5. Regardless of the type of solvent in use,

almost without exception some degree of dermatitis occurs on the hands and arms of workers. In many instances the degree of injury is trivial and of slight duration.

6. It is not yet possible safely to evaluate the exposures arising from the use of such new high-boiling petroleum fractions as the F-140, type.

7. Fancy spotters are undoubtedly exposed to a wide variety of solvent vapors as well as other chemicals, but the extent of this exposure is difficult to quantitate for the industry as a whole. Unquestionably, in specific instances, spotters have been exposed to chlorinated solvent vapors as much as cleaners working with these solvents.

8. In general, it is believed that the other hazards of the industry such as unnatural postures, tenovitis, excessive humidity, moisture, heat, and carbon monoxide are of minor significance.

Marrying a Nurse

W. E. TANNER recalled how some years ago Sir Cooper Perry had given the following advice to those who contemplated marrying a nurse, viz.: "Notice what shoes she wears, see her in mufti, and visit her parents." Mr. Tanner said that whatever a nurse might do when in mufti, when they knew in all truth that sweet artifice might be necessary, a nurse

should remember that the beautiful simplicity of her uniform did not lend itself to the excessive use of rouge, lipstick, and the darker shades of nail varnish. Complete cleanliness, absolute tidiness, and well-shod feet were the complementary essentials of the scientifically trained practical nurse.—*Editorial Notes. J. Roy. Inst. Pub. Health & Hyg., July, 1938.*

Methods of Estimating Postcensal Populations*

HENRY S. SHRYOCK, JR., PH.D.

School of Public Affairs, Princeton University, Princeton, N. J.

ESTIMATES of population for the contemporary years after a federal census have been made by highly approximate methods for the states, cities, and counties in the United States. The degree of inaccuracy tends to vary directly with the time elapsed since the census, and inversely with the size of the population. Within 3 or 4 years' time the seriousness of the error for any of these types of areas is, on the average, large enough to render most uncertain comparisons of vital rates from year to year or from place to place. The value of population estimates in their numerous other applications is also impaired.

It should not be thought, however, that no progress has been made in the methodology of estimation since the U. S. Bureau of the Census and other agencies first began to make estimates. The bureau's adoption of the so-called "apportionment method" represented a definite advance over the earlier method of arithmetic increase. Recognition of the fact that postcensal estimates should be based upon contemporary data for the given area rather than upon merely some hypothesis of growth was another important step for-

ward toward the creation of improved methods and technics. Attention is now being focused upon potential sources of such data and upon means of making them more useful as bases of population estimates.

Accordingly, methods that rest solely upon a hypothesis of growth will be dismissed with a bare mention. They include arithmetic and geometric progression, the fitting and extrapolation of other mathematical curves (especially the Pearl-Reed Curve), and the empirical procedure of Thompson and Whelton.¹

From 1926 until 1934 the Bureau of the Census made its estimates for state and city populations by the apportionment formula. This formula assumes that the estimated postcensal increase in the national population was divided among these states or cities according to their shares in the national increase of the previous intercensal decade. The official state estimates for 1934, 1935, and 1936 were based upon vital statistics and elementary school enrollment data in a manner that will be described below. Censuses taken by 5 states were also utilized. The bureau has released no city estimates since 1933, and there have been no official estimates of the population of counties since the last census.²

There is not much of a problem remaining in the calculation of estimates

* Read at a Joint Session of the American Statistical Association and the Vital Statistics Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

for the total population of continental United States. The excess of births over deaths and the difference between immigration and emigration are added cumulatively each year to the population at the last census. The only unknown quantities are the amount of underregistration of births and deaths and the extent of illegal immigration. Corrections have been made for the first two of these. Underregistration of births is certainly the most important of the three. It may have amounted to about 8 per cent of all births during the first half of the present decade. Yet despite these uncertainties, the bureau was able to estimate the population of the United States just prior to the last census date with an error of only ± 0.15 per cent.

Despite the experimentation that has been carried on from time to time in the Bureau of the Census and elsewhere, state and city estimates still pose a formidable problem. The unsatisfactory results of the apportionment formula are indicated by an average error of 6.88 per cent* for state populations computed for April 1, 1930. The corresponding average error for cities having 10,000 or more inhabitants in 1920 was far greater.

Let us first consider methods of making postcensal population estimates for states. For these, as for cities and counties, school statistics are the series of contemporary data that generally have the highest combined degree of utility, uniformity, and availability. The writer has demonstrated elsewhere³ that any reasonable use of the elementary⁴ school enrollment data collected from the states by the U. S. Office of Education yielded an average error for 1930 state populations that was significantly lower than that cited above for the apportionment formula.

The best of these had an average error of 4.21 per cent. The corresponding root-mean-square deviations about zero per cent error were 10.14 per cent for apportionment and 6.32 per cent for enrollment. Further experimentation showed that enrollment data by age (rather than by grade) of comparable accuracy with those in the "School Attendance" chapter of the U. S. Census volumes could reduce, with proper manipulation, this average error to between 2 and 3 per cent. Unfortunately, such data are not now readily available for more than a few states.

While working at the Bureau of the Census in 1936, John D. Durand and the writer devised a somewhat similar method using existing data on enrollment in elementary grades. This method has been called the "migration and natural increase" method, and it was essentially the one used in the official state estimates for 1934, 1935, and 1936. It is a very elaborate and time consuming procedure. Essentially, however, the method falls into two parts. The difference between registered births and deaths, both corrected for underregistration, is considered as the postcensal natural increase and is added to the state population at the last census. The net interstate migration of school children is estimated from a state's actual and expected elementary school enrollment. The migratory gain or loss in this group is prorated to persons of all ages. The final net change due to migration is then added to the calculated natural increase and the census population to get the postcensal estimate. The main source of difficulty is finding the school enrollment that was expected had there been no migration. The detailed procedure is to be found only in unpublished reports.

There has not yet been an opportunity to test the method for a sufficiently large number of cases to

* Throughout this paper the term "average error" denotes mean percentage deviation from the enumerated population, disregarding the sign of the error.

define its relative worth with any degree of accuracy. A check against 8 state censuses taken from 1934 to 1936 showed an average error of 3.04 per cent. This average compares favorably with one of 3.84 per cent for the same states estimated by the apportionment formula. By all logical considerations this method is superior to the simpler ones using school enrollment, and it has already been shown that these give better results than the apportionment formula.

Nevertheless, we should strive rapidly to improve upon this new method for states. It has many obvious weaknesses, and we are certain that the resulting estimates are not in general adequate for the vital statistician. In a recent investigation undertaken at Princeton University, Durand demonstrated that wide margins of error in the estimated net migration result from necessary approximations in calculating the ratio of enrollment in grades 1-8 to enrollment in a given age group, such as 6-14. This difficulty could be eliminated by obtaining actual enrollment by age as the basic data. Accurate school censuses with carefully defined age limits would further simplify the method. Unfortunately, Durand also found that 28 school censuses taken in 1930 deviated by an average of 4.2 per cent from the enumerations of the same age group made by the federal census. Only 9 deviated by less than 2 per cent.

Other original work on methods utilizing elementary school enrollment is being carried on by Paul V. Lane of the California Taxpayer's Association.⁵ He too has made separate estimates of population change from natural increase and net migration. His expected enrollment was arrived at by a study of the progression of school children through the grades. Enrollment in grades 2-7 in one year less "normal losses" (from death, with-

drawal, and retardation) is compared with enrollment in grades 3-8 the next year. The difference is attributed to net migration. Apparently, however, no essentially satisfactory method has yet been found for ascertaining the rate of these "normal losses" in the schools of a given area. Lane's method may be applied equally well to cities and counties if births and deaths are properly allocated by residence.

School statistics might be improved so as to present accurate data on enrollment by age in all schools, private as well as public, corrected for the actual residence of the child; or they might take the form of school census figures collected every year, giving age at last birthday. These valuable data still would be able to inform us about the migratory movements of only a minority of the population. Inferences about the corresponding movements of persons in other age groups, particularly adults without young children, would remain highly speculative.

There are for most states but few contemporary series of statistics that can be used to supplement school data. One possible source is the registered deaths for specific age groups by sex and color. Lane and Durand independently worked out technics for utilizing such data in population estimates. Assuming that the specific death rates of 1930 for states have remained unchanged to the postcensal year or have changed in some specified way, they divided these rates into the corresponding registered deaths to obtain estimates of the population in the specific age groups.

It was found best to estimate only the population above school age by this method and to get the number of persons of school age and preschool age from school statistics and registered births. Durand has also tried limiting the procedure to deaths from non-epi-

demographic causes. Although this approach involves a degree of circular reasoning when the estimates are applied to the calculation of crude death rates, it is far superior to population estimation based on total registered deaths and the crude death rate at the last census. In the very few comparisons that could be made with estimates from the migration and natural increase method, the latter appeared to be more satisfactory.

Let us now turn to postcensal estimates for cities. These are in general even worse than those for states, but there is a continually large demand for them. For city school enrollments the U. S. Office of Education does not make a separate classification of grades 1-8, but such data usually are available in local reports. The migration and natural increase method used for states is not readily applicable to cities. On the average, but by no means in all cases, school statistics even when used alone give more accurate results for cities than the apportionment formula. The major problem is to estimate the ratio of enrolled or enumerated children to the population of all ages. This is a surprisingly variable ratio. Over the period 1930 to 1935 this variability led to an average error of 6.52 per cent * in the population estimates for Massachusetts cities or towns of 10,000 or more inhabitants.

By way of compensation, there are many more series of pertinent contemporary data for cities than for states. These include the number of listings in city directories, population counts from real property inventories, and public utility records of consumers. All of these usually require extensive refinement. They may be used to supplement one another or school statistics.

Durand devoted considerable study to the contents of city directories when he was with the Bureau of the Census. Very often the number of individuals listed can be obtained only from the publisher. Other limitations are failure to confine the listings to the corporate area of the city, duplication through listing of an individual both at his residence and at his business address, and changes in the minimum age required for inclusion.

During 1934 real property inventories were taken by the United States Bureau of Foreign and Domestic Commerce in many large or medium sized cities. Since then others have also been financed from work relief funds. Most of the surveys included an enumeration of persons living in families. From the relationship of family and quasi-family or institutional population in 1930, the number of persons not living in families may be estimated. The sum of the enumerated family population and the derived quasi-family population represents an estimate of the total population. Of the 64 cities included in the 1934 real property inventories of the U. S. Bureau of Foreign and Domestic Commerce, 7 were also covered by recent state censuses. After adjustment to the proper date, the average discrepancy for these 7 was found to be 3.80 per cent.

The records of utility companies on domestic consumers of water, gas, and electricity, and telephone subscribers are moderately useful for population estimates. The chief weaknesses of these series lie in their close dependence upon economic conditions and in the difficulty of isolating the figures for the city proper, exclusive of suburbs. So few city populations have been estimated from the same type of public utility data that it is impossible to say more than that this source does not appear at present to be especially promising.

* Estimates were made from school census of children 7-13 inclusive and the 1930 ratio. The estimates were compared with the returns of the 1935 state census.

It may be recalled that state populations have been estimated from resident births, school enrollment, and age-specific deaths. These three series could be used for the age groups 0-4, 5-14, and 15 and over, respectively. Similar composite estimates can be made for cities. For example, the 1934 populations of 13 Massachusetts cities or towns having 25,000 or more inhabitants in 1930 were estimated from registered births, school enrollment, and directory listings. The average error was 3.40 per cent. When directory listings and school enrollment had been used separately the average errors were 6.03 and 3.77 per cent, respectively. Similar experimentation on other cities indicates that this approach is a promising one.

Another technic may be used when several series of data are available that do not apply to different age groups. If a list of city or state populations is being estimated, we may find the means of the corresponding estimates from two or more different methods. The average error of the series of combined estimates may be lower than the average error of any of the original series. This effect is obtained only when the errors by the original methods are not too disparate and when the corresponding errors are not correlated. For instance, three unrelated methods for the above 13 Massachusetts cities yielded 1934 estimates with average errors of 2.71, 3.40, and 3.40 per cent. The arithmetic mean of these estimates had an average error of only 2.31 per cent. It may also be remembered that the apportionment formula gave an average error of 6.88 per cent for state estimates as of 1930 and that a method using public elementary school enrollment gave one of 4.21 per cent. If the two estimates for each state are averaged we obtain a new average error for all state of only 3.71 per cent.

This technic of combining estimates has the disadvantage of giving larger errors for some of the populations in the series than those given by the best of the original methods. Very often one method may be superior to another in one section of the United States or in certain parts of a state but inferior in others. Where such a situation is known it is clearly the more sensible procedure to use different methods for different areas. However, one must study the relative worth of various methods to see whether in a particular state or city the past superiority of an otherwise inferior method represents part of a consistent pattern or merely a chance relationship.

From the size of the errors cited in this paper it can be seen that postcensal estimates despite recent improvements in methodology are still too inaccurate for scientific and most administrative uses. The writer feels that the greatest improvement in the future will come not from new technics or methods but from the exploitation of new series of contemporary data and the refinement of old ones. The Bureau of the Census ought to have a permanent section for making postcensal estimates of population. Meanwhile state and city planning boards and health departments should not be content with the arithmetic method or with curve-fitting. In their own experimentation they can test local material much more exhaustively than the Bureau of the Census can ever do. Although much progress thus may be made, it is not likely to remove the imperative need for more frequent federal censuses, supplemented by sample enumerations and locally undertaken census, or for a population register.

REFERENCES

1. Whelpton, P. K. An Empirical Method of Calculating Future Population. *J. Am. Statist. A.*, 31, 195:457-473 (Sept.), 1936.
2. A release of May 29, 1937, presented the

results of all local censuses of cities since 1930.

3. Shryock, Henry S., Jr. The Postcensal Estimation of Population in the United States, unpublished Ph.D. thesis, University of Wisconsin, 1937.

4. Elementary enrollment as used in this paper

refers always to enrollment in grades 1-8 inclusive, regardless of whether grades 7 and 8 are in a junior high school system. In several southern states grades 1-7 inclusive are meant.

5. His findings are reports in that Association's publication, *The Tax Digest*.

"Federal Money is Not Manna from Heaven"

EDWARD S. Godfrey, Jr., M.D., New York State Commissioner of Health, in an address at the Conference of Health Officers and Public Health Nurses at Saratoga Springs recently, warned that federal funds allotted to New York State and to the several states for public health services should be spent wisely or not at all. "Even more important," he said, "these federal grants cannot replace current expenditures and must not replace local expenditures that might have been appropriated for health work were federal grants not available. State and federal expenditures must serve to stimulate local interest and local expenditure for the control of communicable disease."

Dr. Godfrey asserted that states and local governments must not lean heavily on the federal government for assistance in essential health services but rather the states must reserve every essential state right and must not fall into the dangerous tendency akin to

that of relief clients looking to the government for their living. "Not only must we not become confirmed dependents; we must not become dependents at all. We must exert ourselves and use our resources to assist in every way possible to effect the early eradication of preventable disease."

Dr. Godfrey added that the public must understand that the provision of 1 nurse for 10,000 to 20,000 people must be regarded as wholly inadequate and that a nursing service on this scale merely touches the surface. It is also too superficial to produce a public impression. It can never implement the programs for the reduction of infant and maternal mortality, the rehabilitation of crippled children, the eradication of tuberculosis and of syphilis, or the reduction in pneumonia mortality—each and all of which we have every reason to believe the public wants us to do, that we want to do and that we can do if we are given the support we need.

Handicaps in the Normal Growth and Development of Rural Negro Children

HILDRUS A. POINDEXTER, M.D.

*Professor of Bacteriology, Preventive Medicine and Public Health,
Howard University, Washington, D. C.; and Temporary
Epidemiologist in Charge of a Rural Health Unit
in Glendora, Miss.*

THE worth while racial potentialities of Negro infants born and reared in rural southern environment are not sufficiently well developed at chronological maturity to make them either a local community asset or prepare them for respectable social adjustment elsewhere. The longer one observes large cross-sections of these Negroes, the more true this statement appears to be.

One might expect that the unnecessarily high death rates among the young children, due to the operation of the law of "survival of the fittest," would eliminate the weak and leave only the strong. In many sections of the lowlands, if only the physical stature of the young adult is considered, the expectation is confirmed to some extent. If, on the other hand, one considers the whole individual; his physical and mental attributes, and his personality, together with their interrelationship, the wholesome, positive qualities are few.

The problem of the handicapped rural Negro is becoming increasingly serious. He is becoming more and more recognized as the reservoir for certain diseases, such as the venereal diseases and malaria. He is propagating an increasingly large percentage of the race and is becoming more responsible for a stigmatizing increase of juvenile de-

linquency and young adult crime. Many of the factors contributing to the latter two categories are due to the blind migration from the rural areas to metropolitan centers, and to his not being prepared for a respectable adjustment in a more complex society. He increases the city relief rolls and unemployment, and also becomes easy prey to temptations and criminal exploitations of his own race and the white race.

The rural Negro child is handicapped in normal growth and development, not only because he harbors certain microorganisms that are associated with his environment, but by lack of socio-intellectual facilities and opportunities. If one agrees with Patry¹ that "when the healthy person is in a state of dynamic balance on all levels of integration—structural, physiologic, biochemical, endocrine, neurologic, and psychologic—he feels adequate in meeting life vicissitudes," one must admit that very few of the rural Negroes born and reared in the southern states become healthy adults.

I list and briefly discuss the four major interrelated handicaps which are interfering with the normal physical, mental, emotional, and social growth and development of rural Negro children in the "cotton belt." The basis

for these opinions comes from the writer's personal observations while in the service of a hospital in Alabama in 1929, and from two special surveys, in which a social epidemiological analysis was made of the findings from a physical, stool and blood examination of 706 rural Negroes in Bullock County, Ala., in 1934,² and of 1,975 rural Negroes in Tallahatchie County, Miss., in 1937.

FIRST MAJOR HANDICAP

NON-INFECTIOUS MALNUTRITION

Non-infectious malnutrition is an arbitrary designation for a group of children whose physical findings and social history show that they are below par, but in whom the laboratory examinations and history do not reveal either hookworm, malaria, syphilis, or tuberculosis infection or infestation.

In our Alabama survey, 18 per cent of the children come under this group. In the Delta region of Mississippi only 7 per cent of the children come under this group, but in the hilly sections of the state the percentage was as high as in Alabama. These children were anemic (hemoglobin below 75 per cent), their muscles were flabby, their posture was poor, and many showed pyogenic and pellagic conditions of the skin. Sore eyes were common, and more than 50 per cent of those over 8 years showed some degree of dental caries.

This state of non-infectious malnutrition has been observed for many years by representatives of the various state boards of health, but only rarely does this group of individuals appear in their annual reports as a significant rural health problem. It seems as though the mental and physical state of asthenia among these rural Negro children are accepted as relative normalities for the group. This is not a wholesome attitude.

An analysis of the families from which the children of this group come

showed not only environmental lack of sanitation, but a history of a deficient diet for 5 to 7 months out of each year, during which, meal, meat, and molasses were the diet of the old and the young. This is true in spite of the fact that both the climate and the land on which they live are suitable for the growth of different vegetables the year round. One of the great needs for the families of this group is instruction in how to raise and properly store what they need on the land that they till, even at the expense of an acre of cotton more or less.

SECOND MAJOR HANDICAP

SYPHILIS

In metropolitan areas the high incidence of syphilis and tuberculosis generally comes from the same locality and group. However, in our surveys we found that this was not the case in rural areas; the exception being the young adult female.

The rural areas of the southern states, more than at any other time in many decades, are now the weakest link in our public health chain. The health status of the Negro is important to all because he makes up several of these weak links, and when the problem is "syphilis control," he becomes a dominant segment of the chain. The rural Negro, due to no fault of his own, is becoming more and more the reservoir for syphilis in the United States. Three factors seem to play a large part in this increasing prevalence:

1. There are increased opportunities for exposure. Due to better transportation facilities, the rural Negro farmer goes to the small town or village every Saturday. Finding no provision for his wholesome recreation, the small town prostitutes become his means of relaxation, stimulated by the much too common use of alcoholic beverages. The rural Negro does not have proper information concerning venereal disease prophylaxis, becomes infected, and in due time infects other members of his family and community.

2. The aimless town-to-town migration of

the young male adult who with promiscuity and favor spreads the disease along his pathway. These "floating fathers" play an important part in the family history of congenital syphilis and illegitimacy.

3. There is a lack of facilities for the diagnosis, treatment, and follow up; and until recently, there was a definite apathy on the part of the white people in the community toward this condition.

According to physical examinations and standard complement-fixation and precipitation serology tests, 14 per cent of the children under 20 years of age in the Mississippi survey had syphilis. Because of histories of early sexual practices in some, the congenital and acquired cases in this group were not separated. The incidence of those between 20 and 34 years of age was 31 per cent. The number of children tested for syphilis in the Alabama group was too small for analysis, but the percentage of those between 20 and 34 years of age with syphilis was 27 per cent. Even though practically all of the people covered by our survey were poor and of low intelligence, the highest incidence of these syphilitics under 20 years of age come from families where even greater poverty and ignorance exist.

The chances of the children of untreated syphilitic women becoming a community asset are not good. In many cases, the results of conception are abortion, stillbirth, or a syphilitic live baby, weakened by the effects of the *Treponema pallidum* and apt to die very early in life. If, however, he lives to later childhood or even adulthood, there are the syphilitic physical and even mental stigmata to be reckoned with as social problems. In both our Mississippi and Alabama groups of these young syphilitics, in addition to the presence of an anemia and flabby muscles, there were also some of the classical stigmata of eyes, ears, mouth, and nose or bony changes. In addition to the physical handicaps, there were

frequent instances of psychobiological disharmony. It was difficult to tell how much of this was due to lack of opportunities for educational development in the whole community and how much to the presence of the *Treponema pallidum* and the physical defects associated with it. We saw one case of a 13 year old congenital syphilitic with juvenile paresis. The problem of gonorrhea in the young children in these communities is very serious. It is augmented by ignorance and many superstitious ideas and practices which make the young virgin girl a target for attacks which are generally not reported. These superstitious practices often result in infection and pregnancy in these children.

THIRD MAJOR HANDICAP MALARIA

The southern states, from South Carolina to Texas inclusive, show that malaria fever is 4.2 to 6 times as prevalent in Negroes as in whites.³ In our study in Bullock County, Ala., in 1934,⁴ 16 per cent of the Negro children between 5 and 21 years of age showed malaria parasites in their blood upon a single thick blood smear examination, even though acute symptoms were not pronounced. In our Mississippi study in 1937 for the same age group, although only 12 per cent gave positive blood smears, the frequent history of "chills and fever" cured by quinine and the high splenic index lead us to believe that the incidence of malaria is greater in the Delta of Mississippi than in Bullock County, Ala.

The children in this group were generally anemic, asthenic, and lethargic. This is easily understood when one realizes the damage to the reticulo-endothelial system resulting from the deposition of pigment coming from the degenerating plasmodia and red blood corpuscles, the toxin given off by the disintegrating plasmodia, and the sensi-

tizing effect of this toxin on the red blood corpuscles. The resulting fragility predisposes these red blood corpuscles to mechanical and chemical damage. The anemia which follows is a big factor as a handicap of the growing child. In families where the malaria cases were found, only 1 out of every 47 dwellings was properly screened.

FOURTH MAJOR HANDICAP HOOKWORM INFESTATION

Where repeated stool examinations were made, the incidence of hookworm infestation in children between the ages of 9 and 14 years (the age of greatest prevalence) may be as high as 20 per cent. In Bullock County, Ala., we found that 11.7 per cent of the children of 9 to 14 years, showed hookworm ova by a single stool examination. The incidence was higher in boys than in girls. In all positive cases, there was a history of wading or swimming in ponds or creeks. The houses in general did not have sanitary privies or they were not properly used. The incidence of hookworm in the Delta region of Mississippi is much lower than in Alabama or the hills of Mississippi.

Very few of the Negro children who showed ova in their stools had any severe symptoms. They were, however, anemic (some with hemoglobin as low as 40 per cent) and asthenic. Many had sores on their lower extremities. The pathological anemia seems to be the most significant finding. This, we believe, is due to the action of the adult hookworm which attaches itself to the intestinal mucosa after its larval migration and moulting. Not only is there a mechanical loss of blood with the corresponding depletion of iron and calcium, but a definite anticoagulant toxic product is given off by the hookworm which affects the hematopoietic system.

In hookworm infection, as in some

of the other infections, the finding of the organism does not explain all of the symptoms of the disease. We know that if a child had an adequate diet containing inorganic iron, liver, or milk, he would not show the marked symptom of hookworm disease that one occasionally sees. The solution to this problem is greater than merely rendering the child temporarily free from the nematode.

SOME GENERAL UNDERLYING FACTORS

The chief factors responsible for the conditions listed here are ignorance and poverty, to which must be added inadequate social agencies to alleviate the conditions in this group. In the 1937 annual report of the American Social Hygiene Association,⁵ many agencies were listed as participating in the association's programs in various communities. In the Delta regions of the southern states, where the health problems of the rural Negro in regard to certain diseases appear worst, the agencies listed in the association reports⁵ are almost nonexistent or non-functional. Only in a few instances do the official health departments or the boards of education consider the expenditure and activities for promotion of the normal growth and development of the rural Negro child in an unbiased light. The Negro has no race representation and generally gets what he does by a gesture of humanitarianism, which is a late development in the social evolution of man.

In all communities, three structural agencies are present: the home, school, and church. Even though they fall short of doing their share in preparing the children of these rural communities for a more positive participation in the advancement of worth while American life, we must look to them for the solution of many of these problems. In the homes, the parents are frequently more ignorant along lines of

health than the children whom they should guide. In the church, the leadership is frequently untrained, or so much obsessed with fanatic denominationalism that little thought is given to the local problems of hygiene and sanitation and their effects on the normal growth and development of the children. Of all the agencies, the rural school teacher, although underpaid and poorly trained, seems to be the key to the solution for the present.

SUGGESTIONS FOR PRACTICAL IMPROVEMENTS

Specially trained teachers with some originality, flexible enough to make an adjustment and dynamic enough to initiate and supervise community health projects, could correct most of the conditions listed. This "key" person should be well paid and encouraged to stay in a county and work on the problems at hand with some assurance that his efforts will be repaid with sufficient compensation and security. The public health nurse, who is the backbone of any rural public health program, should be closely associated with this "key" person in the school so that small health projects may be integrated into the activities of the schools. Under the supervision and advice of the state and county boards of health and education offices, the teacher, the nurse, and the county farm agent could eradicate in a few years many of the factors responsible for the conditions mentioned.

Diversified farming should take the lead, and there should be a well integrated and not too radical program of information concerning venereal disease control. When dealing with ignorant people of many years of prudery and with unintelligent church officials, extreme tact is necessary in order to get their coöperation in the control of

a disease the solution of which they have preached only morality. The screening of the home, and the building and use of sanitary privies should be a part of the community projects. The teacher and others associated with him in this project can do much to set examples by proper sanitation of the school building and grounds, urging more sanitary methods of handling food and drinking water, and the washing of hands after going to the toilet. The young people will take these practices back to their homes, observe them at picnics, churches, and festivities, and thus influence the community in which they live. There is a great need for leadership of an intelligent character.

SUMMARY

According to recent surveys made in Bullock County, Ala., and Tallahatchie County, Miss., the most common finding in Negro children in rural districts in the South is anemia. This anemia is sufficient to interfere with the normal growth and development, and is due in general to either a dietary inadequacy or to the effects of the three important types of infection; namely, syphilis, malaria, and hookworm. The chief factors responsible for these conditions are ignorance and poverty. These can best be corrected under the present set-up by the use of an efficient local school teacher as the "key" person under the supervision of the official agencies, and with the coöperation of the public health nurse and the farm demonstration agent.

REFERENCES

1. Patry, Frederick L. Psychobiology and Mental Health. *Clin. Med. & Surg.* 45:155, 1938.
2. Poindexter, Hildrus A. The Differential Blood Picture of a Group of Rural Inhabitants of Alabama. *Am. J. M. Sc.*, 190:416, 1935.
3. Grayson, W. B., et al. Malaria in Arkansas. *J. Arkansas Med. Soc.*, 31-32:123 (Jan.), 1936.
4. Personal communication.
5. *J. Social Hyg.*, 24:76 (Feb.), 1938.

A Critical Discussion of Some Methods and Standards for Certified Milk*

J. HOWARD BROWN, PH.D.

Department of Pathology and Bacteriology, Johns Hopkins University, Baltimore, Md.; Chairman of the Committee on Methods and Standards of the American Association of Medical Milk Commissions

IN the title of this paper, the word critical is used in its classical sense, meaning an analytical or judicial discussion, a critique. The discussion is confined to *some* of the methods and standards for the production of certified milk which in some respects may be at variance with the thought, organization, and administrative procedure of health departments and the standard methods employed in most milk control laboratories. I hope to show the reasons for regarding the supervision of certified milk production as a special problem requiring special methods and standards. In doing so, I shall discuss (1) certain features of medical milk commission control, (2) the bacteriological methods and standards for certified milk, and (3) pasteurization of certified milk.

There is not sufficient time to go into the details of stable practice, care of equipment, construction of buildings and equipment, etc., important as are some of these details. However, it is a fact, as you know, that a conscientious, capable dairyman may produce a good product with rather simple equipment and in rather unattractive surround-

ings; whereas, with a fine herd, excellent equipment, and attractive surroundings, an unreliable, slipshod or incapable dairyman may produce a poor product. The safety and quality of the milk are the objectives; the other factors are means to this end. I would, therefore, rate the qualifications of the dairyman as of chief importance in the production of certified milk.

The Medical Milk Commission is usually appointed by a state, county, or city medical society. It has no official standing except such as may be recognized in the community which it serves. Because of its unofficial standing, the commission enjoys the privilege of private contract. It may and does refuse to enter into a contract with a dairyman whom it regards as lacking "proper interest and intentions" even though he may have suitable livestock and equipment for the production of certified milk. It would be more difficult for public health officials to take this attitude. Composed, as it is, mostly of physicians, the medical milk commission is particularly well qualified to exercise medical supervision of dairy employees which it does by providing a Commission physician who visits the certified milk farm each week, more often if necessary, and who subjects every new employee to a thorough

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

medical examination before he is allowed to begin work, and periodically thereafter. It is hardly reasonable to expect a health department to render this service to such a small minority of producers as are engaged in the production of certified milk.

The bacteriological standards for certified milk require that it "shall contain not more than 10,000 bacteria per c.c." when delivered to the consumer and that certified milk-pasteurized shall contain "not more than 500 bacteria per c.c.," as determined by plate counts in a special agar, referred to as A.A.M.M.C. agar, which has been found to yield considerably higher counts than does the standard nutrient agar of the A.P.H.A., counts of the same magnitude as may be obtained with the "tryptone glucose skim milk agar" recently advocated by Breed and his associates. The improved medium not only gives a bacterial count that is more nearly true but its adoption serves, in effect, to raise the standard for certified milk.

During the first year of its use the Committee on Methods and Standards of the American Association of Medical Milk Commissions has compiled data, involving over 1,300 milk samples, from laboratories in 25 cities using this medium. These results are presented in Chart I. In this chart it will be noted that in the improved agar 91 per cent of the samples of unpasteurized certified milk had counts below 10,000 per c.c. We may call this a "compliance rating of 91 per cent." The compliance rating for certified milk-pasteurized, with a required maximum count of 500 per c.c., was 80 per cent. It is obviously impossible to compute a compliance rating for counts of other grades of milk since the legal requirements differ in various localities; but if we should assume a legal maximum count of 30,000 per c.c., the compliance rating of other grades of pasteurized or raw milk would be 80 per cent, and in order to have a rating of 91 per cent, the legal requirement would have to be

CHART I
Comparative Plate Counts of All Milk Samples in A.A.M.M.C. Agar

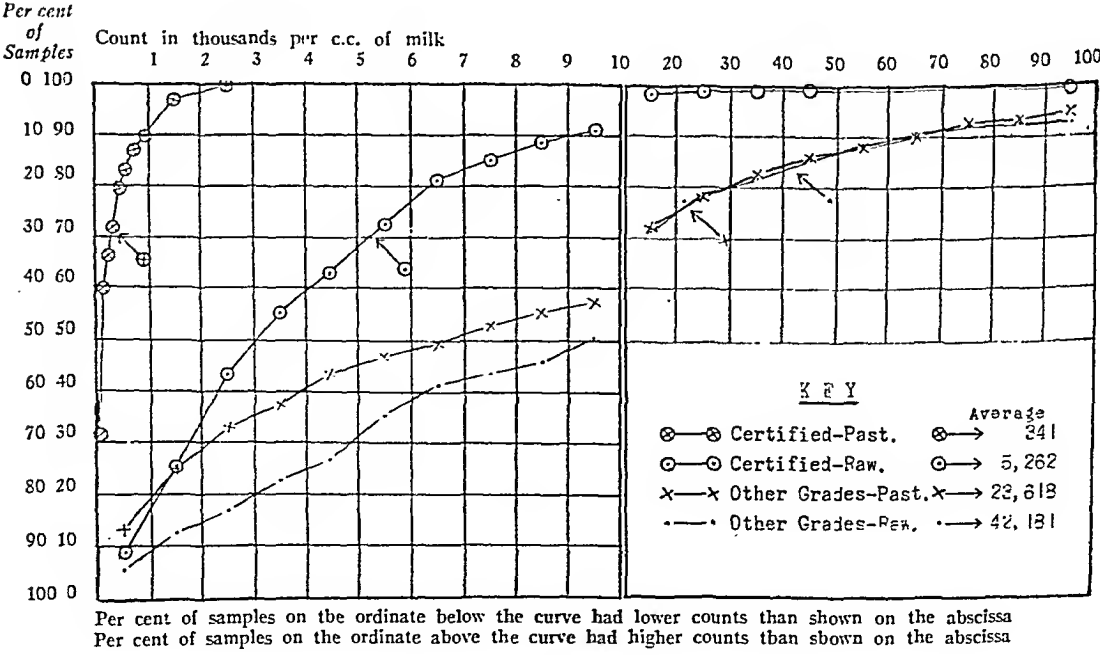


TABLE I

Comparison of Plate Counts of Milk from Two Different Producers.

<i>Milk 1</i>		<i>Milk 2</i>	
	600		4,000
	50,000		7,000
	1,500		5,000
	2,000		4,500
	100,000		8,000
	8,000		5,500
	4,000		3,800
	6,000		3,500
	500		6,000
	13,000		5,250
<hr/>		<hr/>	
Log. Average	5,070	Log. Average	5,080
Arith. Average	18,560	Arith. Average	5,255
Uniformity Rating	27%	Uniformity Rating	96%

If the standard for the above milks was 10,000 colonies per c.c., Milk 1 would have a Compliance Rating of 70% and Milk 2, 100%.

70,000 per c.c. The arithmetical average of the samples of unpasteurized certified milk was 5,262 per c.c. The logarithmic average was 3,425 per c.c. The judging of milk by averages is not recognized by the Methods and Standards for Certified Milk since it is required that the milk shall be of uniformly low count rather than of average low count. However, by computing a ratio between the logarithmic average and the arithmetical average, one may obtain a "uniformity rating" of the product. This may be illustrated by the examples given in Table I. The logarithmic average of the two milks are approximately the same although the arithmetical average of Milk 1 is more than three times that of Milk 2. If we had a perfectly uniform milk the logarithmic average would be the same as the arithmetical average and the uniformity rating would be 1.0. In my estimation, the logarithmic average serves too effectively to minimize and conceal the faults of Milk 1. On the other hand, it is the opinion of some that the arithmetical average imposes undue penalties for occasional high counts.

I am aware that there is a growing tendency in milk control work not to publicize actual milk counts or averages. However, if the uniformity ratings and the compliance ratings of these milks are compared, a fairly accurate idea of their bacteriological quality is obtained provided the basis of the compliance rating is known. Computed by this method, the uniformity rating of the samples of certified milk-raw, shown in Chart I is 66 per cent; that of certified milk-pasteurized, 58 per cent; other grades of pasteurized milk, 31 per cent; other grades of raw milk, 25 per cent. With a knowledge of the required bacterial count, the compliance rating, and the uniformity rating, one obtains more nearly complete information of the bacteriological quality of the milk than is revealed by either the arithmetical or the logarithmic average. The reductase test is not suitable for milk of low bacterial count.

The Methods and Standards require that certified milk-raw "shall contain fewer than 10 organisms of the coli group (*Escherichia* or *Aerobacter*) per c.c. of milk" and state that "properly pasteurized milk should contain no

problem. All milk should not be regarded simply as "raw" or "pasteurized." Even though the volume of certified milk may be relatively small, it is worth while to have in any community a product which shows how good milk can be. Such a product should be used to exert an influence on the entire industry and to strengthen the hands of milk control officials. The Methods and Standards for the Production of Certified Milk are to be "regarded as minimal" and may be

augmented by local requirements. If, at any time, a certified milk is regarded as below standard, health authorities should report it to the American Association of Medical Milk Commissions, Inc., 1265 Broadway, New York, N. Y. Certified Milk should be a coöperative enterprise among producers, milk commissions, and health authorities.

REFERENCE

1. Yale, M. W. Comparison of Solid with Liquid Media as a Means of Determining the Presence of Lactose Fermenting Bacteria in Pasteurized Milk. *A.J.P.H.*, 27, 6:564 (June), 1937.

Rheumatism

IN recent years we have almost removed from the list of killing diseases enteric fever and smallpox, and the rôle of Public Enemy No. 1 seems now to be given properly to rheumatism—to which at least one-sixth of our expenditure under National Health Insurance is attributable.

Fortunately the study of rheumatism is becoming accepted as a

world problem, and the obscure origin of this disease is being gradually clarified—though we are not yet able to explain such problems as why rheumatoid arthritis afflicts six times as many women as men between the ages of 25 and 34.—Presidential Address, Blackpool Congress, May, 1938. *J. Roy. Inst. Pub. Health & Hyg.*, July, 1938.

that it shall be pasteurized and bottled on the farm where it is produced and that the pasteurizing equipment shall not be used for the pasteurization of any other grade of milk. Since these requirements may appear to be at variance with public health regulations for the pasteurization of other grades of milk, I wish to present the reasons for them, from the viewpoint of the American Association of Medical Milk Commissions.

It is regarded as necessary not only to maintain the identity of certified milk as distinguished from other grades of milk but to maintain the identity of the milk from each individual farm. This would be found to be of enormous public health value if pathogenic organisms should gain entrance to a certified milk supply. Not only would it limit the spread of an epidemic but it would enable the public health officials to trace the source of the epidemic almost immediately. It is desirable to fix the responsibility for the safety and quality of every bottle of certified milk onto the individual producer rather than to divide this responsibility with pasteurizing and bottling plants within the city. It is not desirable that certified milk bottle caps should be available in plants where other grades of milk are bottled.

Certified milk should not be pasteurized and bottled with equipment used for any other grade of milk. Even though it may be proposed to pasteurize certified milk in clean, sterilized equipment ahead of any other milk that is to be pasteurized, it is doubtful whether this equipment can be guaranteed to be perfectly sterilized every day. It is true that it may be sterilized just as well as the equipment on the certified milk farm, but it must be considered that equipment on a certified milk farm is used for no other grade of milk at any time and that other grades of raw milk are not safe as is indicated by the occurrence of over 380 epidemics traced

to such milk during the past 10 years, whereas only 17 were traced to supposedly pasteurized milk, and none to certified milk. Many of the producers of certified milk are relatively small producers shipping small amounts of milk to a number of distributing points. It is doubtful whether the large city pasteurizing and bottling plant would find it convenient or profitable to postpone the pasteurization of the large volume of other grades of milk until the small volume of certified milk had been run through the equipment. What might happen if the arrival of the certified milk were delayed?

It is contended that regulations, such as pasteurization within the city, desirable for other grades of mixed milk, would tend to lessen the safety and lose the identity of certified milk which there is every reason to believe is a safe milk before it is pasteurized. Certified milk-pasteurized is required to be certified milk before it is pasteurized. Unfortunately, the effort to maintain it so is more difficult in those communities which have sought to improve the milk supply by requiring that all milk, including certified, shall be pasteurized. Referring back to Chart I, it is noted that the compliance rating of the samples of certified milk-pasteurized examined was 80 per cent. It is rather suggestive to note that all but one of the samples with counts above 500 per c.c. were reported from communities where all milk is required to be pasteurized, and, referring to Chart II, that all of the samples containing coli group organisms were also from such communities. It is feared that the knowledge that all the milk is to be pasteurized leads to lack of interest in clean safe milk production. The best certified milk-pasteurized is to be found where some of the milk is sold as certified milk-raw.

For these and other reasons certified milk should be regarded as a special

A More Effective School Health Program*

JOHN T. PHAIR, M.D., D.P.H.

Chief Medical Officer of Health for Ontario, Toronto, Ont.

SCHOOL health supervision as it exists today is a logical but inhibited outgrowth of the original effort known as school medical inspection, which was designed primarily to control contagion. The latter name still clings to it, despite the fact that in many centers, particularly in Canada, no physician is associated with the service. Its development, like other types of community welfare service, was forced, in that new fields of effort were allocated to those associated with the plan without permitting them an opportunity for the consolidation of ground already won. By this, I mean that, while a useful contribution to the control of communicable disease, particularly such contagious conditions as pediculosis, scabies, impetigo, etc., was made, the status of the original program was never more than that of a logical auxiliary to an acceptable community health service.

Imposed upon such a foundation the added responsibility entailed in the regular examination of the presumably healthy child increased the instability of this rather loosely built structure. The lack of special training and enthusiasm on the part of the staff resulted on occasion in administrative indigestion and thinly veiled conflict with the parties most concerned in mat-

ters affecting the health of children, namely, the parents and the medical profession. The program has also possibly suffered from the attitude of some of those propagandists who sponsored its adoption during the days of its rapid extension on this continent. Convinced of its merit, in their desire to impress municipal and school authorities with its value, they implied finality as to procedure and exaggerated its potentialities.

Referring briefly to its original accomplishments in the field of communicable disease control, we are inclined to wonder just what were the conditions which made possible so much in the way of achievement, having in mind the limited qualifications of the staff and the methods adopted. Actually, much of the success attained was due to the failure on the part of both the public and the medical profession to manifest any serious concern with the official requirements in the matter of controlling the spread of contagion. These were the days when the interest of the family physician in this field was confined to the reporting of small-pox and diphtheria and when absence from school for scabies or ringworm might, if there was no parental concern for the education of the affected offspring, extend to the best part of the school term.

Criticism has been leveled at the methods designed to achieve the first of the commonly recited objectives.

* Read before the CHM Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

In the early days of the service when all of the emphasis was placed on the control of communicable disease, the accepted procedure was to have all children showing evidence of suspected contagion referred to the school physician, who visited each school in his district daily. Those who were unable to present a convincing excuse for absence were also likely to be included in this group. When the nurse became an accepted member of the staff, routine classroom inspection was added to the list of endorsed procedures. Then followed the post-holiday rapid inspection and the special daily review of affected classrooms or schools when certain diseases were epidemic in the community. Home visiting by the nurse and physician of suspected absentees was at first a fruitful source of investigation. In an effort to insure the interest of teachers, the daily readmission of all returning absentees was ultimately resorted to. Children who had been absent for a minimum of 2 days were sent to the appropriate office upon the arrival of the school nurse or physician. The fact that all too often they had been allowed to mingle freely for from 1 to 3 hours with the other pupils in the classroom was condoned when it could not be controlled.

Sound, statistical support on behalf of this branch of the service is not readily obtained; neither is it possible to refute statistically its value. Going over old reports I find reference to the statement that 40-50 per cent of the cases of communicable disease reported in certain urban centers were reported by the school health staff and that many of these cases were found in the classroom. Presuming this to be an approximation of what may have been true, and comparing it with figures for the Province of Ontario, we find that the percentage has fallen to the point where one might be justified in ques-

tioning the necessity for continuing to include this field of effort among the objectives of the service. The same records would appear to imply that the more effective the municipal health organization, the smaller was the percentage of pupils found in school with evidence of communicable illness. Despite the previously referred to implication, however, there is evidence to show that the control of communicable disease still has a place among the objectives set by the advocates of school health supervision.

While one may comment critically on the methods designed to limit the spread of contagious illness, the substantial contribution made by the school authorities to the success of our efforts at active immunization should not go unnoticed. The aid extended, either directly or indirectly, to the health authorities in this constructive effort, has made possible much of the success achieved. Further, the fact that public opinion has been favorably influenced on behalf of such control measures as are effective, must also be added to the non-tangible good which has resulted from this service.

But let us pursue our review of the objectives and their approximation:

Prior to the time when the responsibility for insuring the discovery and correction of present and potential defects was assumed by the school health staff, the program had been rather hesitatingly accepted by the community. It was apparently considered as a service more or less complementary to that carried on by those official agencies which had previously preempted the prerogatives of the public in the matter of the control of communicable forms of illness. Now with this added function, it took on an aspect of municipal paternalism which presumed further to abrogate from the parent the formerly accepted privilege of deciding as to the health needs of his offspring. This

second objective further appeared to be a subtle invasion of the prescribed field heretofore allocated to the family physician. In view of this fact, there was no avid acceptance of the service by either the profession or the public. Even the interested parent was at first lacking in enthusiasm for such a program.

The original presumption that parents would welcome the opportunity of being informed as to the health needs of their children, and following the receipt of such information would take the necessary steps to insure prompt correction of unsatisfactory conditions reported, was found to be applicable to only a limited number, variously estimated as being between 25 and 40 per cent.

The method of examination originally adopted was not designed to placate either parental or professional prejudice and the service suffered some loss of prestige, if it ever had any to lose. The continued questioning of the judgment of the school medical officer by both parent and practitioner led to some modification of the rather casual type of examination originally in effect. That these modifications have not always accomplished the hoped-for result is evident to anyone who carefully reviews the data of some well recorded service.

There have been a variety of methods adopted since the day of the rapid mass examination. In some centers, the examination is as complete as it is possible to make it, with the parent invited to be present; in others, the examination lacks only the presence of the parent. Again, in others, a team of physicians with special qualifications carry out the actual examination after the children have been screened by a nurse or teacher. Again, in some communities, the entire program is in the hands of nurses, supposedly carefully chosen and specially trained for such

service. The variety in method also extends on occasion to the number of examinations to which the child is asked to submit and the stage in his school career in which the examination is to be carried out. In some centers, he is examined on admission and again prior to graduation; in some instances, 3 examinations are made in the school life of the child; while in others, the responsible authorities have been influenced by the advocates of periodic physical examination to the point where they have adopted the plan of annually examining the school population.

It is not my thought that this diversity of method should be considered critically or to imply confusion where none exists, for I realize fully the difficulties which have periodically confronted those responsible for the establishment and conduct of this essential service. I wish merely to say that this multiplicity of method has added to the perplexities of those anxious to insure the extension of school health supervision.

The further expansion of the original program to include a directional interest in all matters pertaining either directly or indirectly to the present or future well-being of the school age child, which objective included in some centers the conduct by the health personnel of the health teaching program, added nothing to the list of supporters of the service. Neither did it tend to lessen the confusion inherent in such a state of affairs, for here we have a service being compelled to expand its program without the opportunity to "mop up" as it went along. To its own critics, and no one has been more critical of its limitations than those engaged administratively in its conduct, two shortcomings stand out:

First, the fact that we have been unable to secure from organized medicine the recognition that the service

justly warrants. This failure can be rightly laid to our own unwillingness to find the proper place for the general practitioner as a co-partner in the scheme. Second, our evident inability to obtain the appropriate correction for physical defects found or suspected.

While the second of these shortcomings looms superficially as the more significant, the first probably in any critical analysis of cause and effect would be considered the more important. However, our concern at the moment is our inability to demonstrate in a tangible fashion the result of our efforts. Innumerable children are found with evidence of some of the commoner physical defects; the parents are informed of the presence of such defects and yet correction is perennially procrastinated or the recommendation flatly ignored.

We have already referred to the apparent unsoundness of the original premise upon which the service was established, namely, that all parents are sufficiently interested in the physical status of their children to accept readily the suggestion that professional advice and treatment are essential. Whether the statistical evidence warrants us in an acceptance of the presumption that the previously mentioned failure to seek medical advice following the receipt of the generously distributed notification of defect is due to lack of interest, whether it is due to some defence reaction, or whether there is some other more acceptable explanation for the condition noted, is to my mind a problem, the solution of which might well be left to the psychologist experienced in evaluating motivating influences. I might add here, however, that while the inability of the family to pay for treatment is a valid reason in a percentage of cases, the number who give this as a justification for inaction is not, on careful inquiry, so great as some of you may presume.

The challenging fact which confronts those of us who are permitted an opportunity to review our service in terms of its accomplishments and limitations is that only 30-40 per cent of conditions (other than dental defects) stated by the school physician to warrant treatment, receive such treatment within 2 years of their discovery. May I state here that I am fully appreciative of the excellent work done by the New York Study Group in the inquiry into the factors influencing this condition, and urge that the findings of the group be carefully reviewed in terms of their possible application to your local problem.*

Without any further assumption of the magisterial prerogative of being wise in retrospect, I wish to record for your critical comment a suggested modification of the plan which has been for many years in effect in the majority of those centers in Ontario in which a physician is associated with the service. In evolving this scheme, we have kept in mind the following presumptive premises, both of which have been referred to in the rather protracted preface, namely, that our failure to include the family physician in our program has contributed definitely to the limitations of our achievement, and that some of our difficulty is due to our evident unwillingness to limit the term "notifiable defect" to those physical or mental abnormalities, the patency of which is such that even the most unconcerned physician is likely to subscribe to their significance.

We suggest that the school health program make provision for the early examination of all beginners; that this examination be as thorough as it is possible to make it, preferably with the parent present; that following examination, the child be placed in one of

* *Physical Defects—The Pathway to Correction*, 1934. Obtainable from A.P.H.A. Book Service.

three categories, labelled for convenience, groups A, B, and C. Group A to include all children found to be presumably well; group B to include those children who, in the estimation of the examiner show some signs of below normal well-being but not displaying an evident physical defect; group C to include all children requiring early medical advice or treatment. The child placed in Group A, as an individual ceases to be a concern of the school medical officer as long as he remains in this category. He would, however, automatically drop into Group B following his having suffered from any accepted type of acute illness. He would then appear at a convenient time for reëxamination by the physician and his category would be subject to revision.

In the event of the child being placed in group B, the assistance of nurse and teacher is sought in an effort to uncover information which might supplement the findings of the examining medical officer. Such information might rightly include the child's dietary and other health habits; his reaction toward work and play; the scope of his extra-curricular activities; and the extent and considered seriousness of those previous illnesses reported by the parent at the time of examination.

In order to avoid confusion, it is recommended that the length of the period of observation be fixed, say at 3 months, and that the physician note on a suitable form, for the guidance of the nurse, those particular points in respect to which he wishes added information.

The nurse is expected to see that the child presents himself for reëxamination at the expiration of the period of observation; at which time, in the light of the knowledge already on hand and the additional information secured, a further attempt is made to estimate the present or future physical status

of the child. He might rightly be continued for a further fixed period of observation in group B; placed in group C; or now stated to belong in group A.

Some such procedure as the above should lessen the possibility of the school health staff committing itself to a premature diagnosis, and places the physician in a more acceptable position in the event of the family practitioner disagreeing as to the clinical accuracy of his findings and recommendations. Further, during the period of observation, the nursing staff is permitted an opportunity to create interest where necessary, in both parent and teacher, in the health of the individual child.

Criticism is levelled at the practicability of any plan of informing the family physician of the school medical officer's findings, without resorting to the dubious method of sending it through the child or parent. Despite such criticism, I do not believe that we should ignore the desirability of establishing an ethical contact between the school health staff and the physician: such contact to be comparable to that associated with our other professional relations with our fellow practitioners. While it is accepted that there are a considerable number of families in any community with no fixed affiliation with any physician, I do not believe that the number of these having children of school age is as large as has been estimated: probably not more than 20-25 per cent are in this class. Those in the lower wage earning group, who will be more than likely dependent for any necessary treatment on the clinic facilities of the community, might rightly be excepted. Granted that this number might even be higher than suggested, I still believe that much good would result from a serious attempt to inform the physician directly of the school physician's findings and

recommendations, since he is the agency responsible for the suggested treatment. It is therefore urged that the school medical officer, at the time of examination—using an acceptable type of form—tell the physician who has been named by the family as the doctor of their choice, exactly what he has found and the implications which he has drawn from such findings. This statement should be mailed promptly and should be as personal as is possible to make it. In those cases in which the child has been under observation and this fact recorded, the position of the school medical officer is materially strengthened. Not only should such a practice encourage more accurate deductions from physical findings by the school medical officer, but it should go a long way to eliminate any feeling of professional irritation upon the part of the general practitioner. Certainly the physician who has before him an intelligent statement from a medical confrere is not likely to find himself in a position of embarrassment, when a parent, having accepted the suggestions of the school medical officer, presents himself or herself at his office with the child concerned.

The physician, following the receipt of the school medical officer's report, may adopt one of three attitudes: he may be sufficiently close to the family to justify his contacting them in respect to the matter without delay; or his relationship may not be sufficiently well established to permit him to do more than wait in anticipation of the parent's acceptance of the advice offered by the school medical officer; or he may ignore the communication entirely. Irrespective of which of these attitudes he adopts, certainly those responsible for the administration of this municipally subsidized service will have the added satisfaction of having offered this tangible evidence

of a desire to coöperate with those of the profession who are engaged largely in the therapeutic side of medicine.

Reference has already been made to the diversity of methods adopted in the matter of so called "follow up." I am strongly of the opinion that in many instances our efforts have been psychologically unsound. In many centers in Ontario, the common practice is to permit the parent who does not proceed at once to implement the school physician's recommendations, a limited period of time in which to initiate treatment. Following the lapse of this period, the nurse is asked to visit the home and, further, encouraged to continue these visits until either the parent or nurse becomes discouraged. The result of this practice is that the parent, caught by the representative of an official agency in this suggested dereliction of his or her duty, develops an attitude of non-coöperation or open resistance to our persuasive efforts and the end we seek becomes unattainable through much striving. It is recommended, therefore, that after an appropriate interval has elapsed, the parent be sent through the mail a tactfully worded communication drawing his or her attention to the desirability of accepting the advice offered at the time of the original communication; and that these letters be regularly forwarded until some concrete evidence of parental interest is exhibited; that there be no direct contact between the parent and the school health staff unless such contact is sought by the parent, until this more indirect method of approach has been found ineffective.

While none of these suggestions may be convincing, either in terms of their originality or their practicability, I do ask that they receive such consideration as they would appear to merit, in that they are brought forward after many years of experience with the procedures usually prescribed.

Cultural Methods for the Detection of Typhoid Carriers*

ELIZABETH J. COPE AND JOSEPH A. KASPER, M.D.

Department of Health, Detroit, Mich.

IN communities where the sanitation is admirable and the food and water supplies receive the fullest attention of the health authorities, typhoid fever continues to be a menace. Although residents of well protected urban centers occasionally contract this disease in some remote rural region, there are sporadic cases and occasional outbreaks which cannot be attributed to such outside sources. They are of endogenous origin, in most instances traceable to undetected carriers, who are the principal obstacles to the complete control of typhoid fever within the community. Their detection requires the constant vigilance of the epidemiologist, who must receive efficient aid from the laboratory.

There has been a long felt need in public health laboratories of a method or procedure which would facilitate the isolation of the typhoid-dysentery group from feces. A medium that would inhibit the growth of the coliform bacteria while permitting the development of the colonies of the typhoid bacilli would be a distinct contribution.

Approximately 18 months ago, our attention was drawn to a dehydrated medium which seemed to possess cer-

tain impressive qualities, the Wilson and Blair¹ bismuth sulphite agar, slightly modified by the Difco Laboratories. This medium, when ready for use, consists of:

	<i>Per cent</i>
Peptone	1.0
Beef Extract	0.5
Dextrose	0.5
Disodium phosphate	0.1
Ferrous sulphate	0.03
Bismuth sulphite indicator	0.8
Brilliant Green	0.0025
Agar	2.0

Growth of colon bacilli is greatly inhibited by bismuth sulphite agar but it is doubtful that they are killed, since it has been possible to obtain growth after transplanting to other media. The inhibition of the colon bacilli allows the typhoid colonies to make their appearance without hindrance. Such colonies are black and flat and, when typical, surrounded by zones of a glistening metallic character confined to the surface of the medium. Although good colonies may be observed after incubation for 24 hours, their appearance is most typical after 48 hours.

The first attempt to evaluate the merits of the bismuth sulphite agar as a medium to be used routinely was made by planting the fecal specimen on Endo agar and on the bismuth agar simultaneously. Cultures on both

* Read before the Laboratory Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 8, 1937.

were made by streaking out loopful amounts of the fecal emulsion on the respective plates. The emulsion was prepared by mixing approximately 5 gm. of the feces with 10 c.c. of physiological salt solution, allowing it to stand for about 1 hour and using the supernatant portion for planting.

In this first comparison, 100 consecutive cultures were made, with results almost alike: but a few discrepancies suggested that not all of the positive cultures possible were being obtained. By this method of planting, the bismuth sulphite agar was found not to be superior to the Endo agar. The colon-inhibiting property of the bismuth sulphite agar was so striking that work was carried on, streaking bismuth medium with the feces directly, while the Endo agar continued to be streaked in the usual manner. By this method, the bismuth agar was found to be approximately 16 per cent more efficient than the Endo agar as judged by the increased number of positive cultures that resulted.

Believing that this increased efficiency of the bismuth sulphite agar was to be accounted for by the use of the more concentrated fecal substance for the cultures, another series of observations was made, which forms the basis of our present report. Three procedures were followed in planting the fecal material of each specimen. Each culture consisted of 3 plates. Endo agar was streaked with a loopful of the fecal emulsion, a bismuth sulphite agar plate was smeared with undiluted feces by means of a cotton swab, and the third plate was prepared by pouring 15 c.c. of the melted bismuth sulphite agar at about 40° C. over 5 c.c. of the fecal emulsion. All plates were examined for typical colonies after 24 hours, which were then transplanted to Krumwiede's triple sugar agar. The bismuth sulphite agar plates were incubated for an addi-

tional 24 hours if no colonies were visible at the end of the first incubation. Whenever the triple sugar reactions were in support of the typhoid-dysentery group, suspensions of the organisms were examined for motility. The final step for establishing the identity of the isolated organisms was agglutination with typhoid and paratyphoid antisera. Only dilutions in titers above 1 to 300 were considered diagnostic. However, most of the reactions were positive in dilutions of 1 to 1,000.

The manner of evaluating the 3 procedures is illustrated in Figure 1. Each symbol is composed of letters appearing in the names arbitrarily chosen for respective procedures, as. E = Endo agar, S = bismuth sulphite agar streaked with feces, P = bismuth sulphite agar poured over emulsion, etc.

In 1 year, the laboratory of the Detroit Department of Health received 2,273 specimens to be examined for the presence of intestinal pathogens, of which 64 were urine, and 2,209 feces. Each specimen was classified according to its source and was listed as coming from a case, a contact, or from a food handler. In the group from cases are included those submitted for diagnosis as well as those for release from hospital or home. In several instances, the case release cultures numbered 20 or more, while the average number of cultures examined for cases was 8. The specimens from contacts were received largely on the advice of the epidemiologist to determine if passive carriers were present in the homes of those suffering from an acute intestinal disease. Occasionally a chronic carrier was discovered by this procedure. Listed as food handlers are those persons who, upon epidemiological investigation prior to receiving permission to engage in the preparation or distribution of food for public consumption,

FIGURE I

Procedure Followed to Evaluate Efficiency of Methods

Endo Agar Plate Streaked	Bismuth Sulphite Agar Plate Streaked	Bismuth Sulphite Agar Plate Poured	Evaluating Symbol
⊕	⊕	⊕	E.S.P.
⊕	⊕	⊖	E.S.
⊕	⊖	⊕	E.P.
⊕	⊖	⊖	E.
⊖	⊖	⊕	P.
⊖	⊕	⊕	S.P.
⊖	⊕	⊖	S.

were suspected of being chronic carriers because of a history of enteric infection.

Table I is a summary of the number of specimens examined for organisms of the typhoid-dysentery group—the total number positive applies only to the finding of typhoid or paratyphoid bacilli. Dysentery bacilli were not considered for purposes of this comparison. Of the 452 positive cultures, 5 showed the presence of *Salmonella schottmülleri*, 2 were positive for *Salmonella paratyphi*; and 2 for both *Salmonelli schottmülleri* and *Salmonella paratyphi*. Reference is also made to initial positive cultures, a group compiled on the basis of the examination made of each person's specimen received for the first time, irrespective of the number of subsequent examinations that were made. The total of 107 of such specimens is an index to the number of car-

riers of the typhoid bacilli according to class. It may be roughly estimated that in Detroit during this study there were 25 cases; 58 contact carriers, either active or passive; 24 carriers who, because of their occupations, would endanger the health of some persons if they were not detected by laboratory means.

The total and initial positive cul-

TABLE I
Specimens of Feces and Urine Examined for
Organisms of Typhoid Group

	Number Examined	Number Positive	Number Initial Positive Cultures
Cases	895	328	25
Contacts	810	75	58
Food Handlers	568	49	24
Total	2,273	452	107

TABLE II

Evaluation of Methods Employed to Obtain 107 Initial Positive Cultures

From:	Number	E.S.P.	E.S.	E.P.	E.	By Means of Endo Medium	P.	S.P.	S.	By Means of Bismuth Medium
Cases	25	14	1	1	3	19	3	2	1	6
Contacts	58	10	..	10	14	34	19	5	..	24
Food Handlers	24	5	1	3	4	15	8	2	1	11
Totals	107	29	2	14	21	64	30	9	2	41
						61.65%				38.35%

TABLE III

Evaluation of Methods Employed to Obtain 452 Positive Cultures

From :	Number	E.S.P.	E.S.	E.P.	By Means of Endo Medium		P.	S.P.	S.	By Means of Bismuth Medium	
Cases	328	41	33	9	81	164	40	102	22	164	
Contacts	75	12	9	7	12	40	15	18	2	35	
Food Handlers	49	13	3	8	11	35	10	2	2	14	
Totals	452	66	45	24	104	239	65	122	26	213	
					52.8%		47.1%				

tures in Table I are again found in Tables II and III. It will be seen that approximately 40 per cent of the positive findings would not have become available had sole reliance been placed on Endo agar for the isolation of the typhoid-paratyphoid organisms, though approximately 20 per cent of the positive cultures were obtained through this medium alone.

While bismuth sulphite agar is a valuable adjunct to Endo agar as a means of isolating a greater number of intestinal pathogens from feces examined routinely, it cannot entirely replace the latter. Moreover, Endo agar in expert hands may be successfully used for the isolation of the dysentery group of organisms that will not be revealed on bismuth sulphite media.

The value of a differential-enrichment medium in the form of bismuth sulphite agar would seem to be firmly established. These results also suggest that future modifications of such media may eventually culminate in further simplifying the routine examination of feces and increase the efficiency of the laboratory as an aid to the epidemiologist in the detection of typhoid carriers.

SUMMARY

An analysis of the merits of the Wil-

son and Blair bismuth sulphite agar, slightly modified, as compared with those of Endo agar for the isolation of intestinal pathogens is based on a total of 2,273 examinations of feces and urine.

In the finding of 452 positive cultures, the bismuth sulphite agar, when poured over 5 c.c. of a heavy fecal emulsion, accounted for an increase of approximately 40 per cent of the positive cultures.

Endo agar accounted for the recovery of typhoid and paratyphoid bacilli from 23 per cent of the number of positive specimens when bismuth sulphite agar failed.

In view of the positive findings obtained by means of the Endo agar alone, it is inadvisable at present to discontinue its use in favor of any recently developed differential plate medium.

A useful purpose will be served by supplementing the use of Endo agar with a differential plate medium such as bismuth sulphite agar for the routine examination of fecal specimens.

REFERENCES

1. Wilson, W. J., and Blair, E. McV. Use of Glucose Bismuth Iron Medium for the Isolation of *B. typhosus* and *B. proteus*. *J. Hyg. (Brit.)*, 26:374, 1927.
- Wilson, W. J. Isolation of Enteric Bacilli from Sewage and Water and Its Bearing on Epidemiology. *Brit. M. J.*, 2:560, Sept. 23, 1933.

Present Status of Vitamin Milks*

E. V. McCOLLUM, PH.D., F.A.P.H.A.

*Professor of Bio-Chemistry, School of Hygiene and Public Health,
Johns Hopkins University, Baltimore, Md.*

THE discovery, in 1922, that rickets in infants and children is caused by deficiency of a specific dietary factor, now known as vitamin D, opened the way to a program of prophylaxis against this disease. The results already obtained, show that the prevention of rickets can be realized, and that this is one of the outstanding achievements in the field of preventive medicine. In temperate regions, the prevention of rickets through the agency of sunlight is not possible of realization. The methods available are: (1) the administration of suitable doses at regular intervals, at least during the colder months, of some one of the fish liver oils which are available; (2) the distribution of concentrates of fish liver oils containing vitamin D; (3) the distribution of viosterol, a product consisting of vitamin D derived from irradiated ergosterol, of yeast; (4) the irradiation of certain commonly used foods; (5) the feeding of irradiated yeast to cows, which then yield milk containing an effective content of vitamin D; (6) the fortification of some commonly used foods with a concentrated source of vitamin D; and (7) the general employment of ultra-violet lamps for irradiating the skin.

The vitaminization of milk, the food most constantly consumed by infants and children, is the method of choice in prophylaxis against rickets. It is the simplest, safest, and most economical way of getting the desired results. The experience of several years leaves no reason to doubt that vitamin D milks have come to stay, and that their distribution will increase.

The question has naturally been asked by many people: Are we liable to get too much vitamin D? *The Journal of the American Medical Association*, commenting on this editorially in 1931, said: "There is evidently an enormous range of safety between prophylactic or therapeutic dosage and the quantities that are likely to do harm. The toxic dose is probably 1,000 times the therapeutic dose of viosterol." The same Journal has also given editorial approval of irradiated milk and milk derived from yeast-fed cows. Up to the present, the latter procedure has been used only by the certified milk industry. It is clear that any of the methods enumerated provide safe and effective sources of the antirachitic vitamin. An important fact is that pasteurization or boiling does not depreciate the value of vitamin D milks. The approved content of added vitamin D in milks for prophylactic purposes is about 400 International Units per quart. This is approximately one-third the commonly

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

used dosage for therapeutic purposes. Vitaminization of milk by any of the methods which are practicable has the advantage over other sources of vitamin D, that the active principle is made available in a highly palatable form. This is especially important to adults who are frequently averse to taking fish liver oils.

There are now scores of reports by clinicians setting forth the effectiveness of the vitamin D milks for prophylaxis against rickets. Opinion seems to be unanimous that the general provision of vitaminized milks is the method of choice. That such milks will have a field of usefulness in dietotherapy in certain diseases affecting adults is equally certain. This view is supported by the considerable number of reports of their use in the treatment of tuberculosis, in the treatment of fractures, in the prevention of tooth decay, in the treatment of trichinosis, in arthritis, and in the improvement of the general health. These milks should be very useful in safeguarding the health of pregnant and lactating women. Bunker and Harris have recently given a comprehensive discussion of the clinical status of vitamin D milks.

Since the vitamin D potency of milk can be determined only through a biological test or bioassay, it is necessary that health officials require such assays at suitable intervals, and that these shall be made by well equipped laboratories. This method is somewhat time consuming and expensive, but it is not necessary that assays be made oftener than once in a few months, provided samples are taken by officials at any time, and without the knowledge of the distributor. This knowledge will keep him on the alert, and insure proper coöperation with health officials in safeguarding the quality of the milks.

The employment of vitamin D con-

centrates made from fish oils insures not only the fortification of milk with vitamin D, but also increases significantly the amount of vitamin A which it will contain. Fortification with viosterol, provides vitamin D only. The same is true of irradiated milk.

After several years of constantly increasing distribution of vitamin D milks, and of extensive discussion of their use by physicians, there is scarcely a dissenting voice from the profession as to the desirability of their use in safeguarding the health of infants and children. Although less often mentioned, it seems clear that the pregnant and lactating woman stands in as great need of additional vitamin D, over that which she secures in eggs—the only food which is commonly eaten which contains appreciable amounts of this substance—as does the infant or child. The palatability of vitamin D milks makes them especially appropriate as a source of this nutrient for women, who generally dislike fish liver oils.

There has been some consideration of the desirability of adding to milk either vitamin C (ascorbic acid) or vitamin B₁, both of which are now available in the form of synthetic products identical with the naturally occurring vitamins.

Freshly drawn milk contains about 22 mg. of ascorbic acid per quart. The content steadily falls off under ordinary methods of handling, even before pasteurization, and the latter treatment destroys practically all of it. The cost of adding sufficient ascorbic acid to milk to make it serve as a safeguard against scurvy, is not prohibitive at present, and may be lowered in the future. The fact that citrous fruit juices are generally available for infants and children, and that raw fruits and vegetables generally are good sources of ascorbic acid, makes it less imperative that milk be forti-

fied with this nutrient than is the case with vitamin D, which is not available in sufficient amount in any of our natural foods. It is not likely that the medical profession will become very enthusiastic about the addition of ascorbic acid to milk for this reason.

As respecting the fortification of milks with the antineuritic vitamin B₁, one may say that there is some prospect that the pediatrician may see advantages in having such milks available, both for infants and for pregnant and lactating women. There is considerable evidence that many people are getting less than the optimal amount of B₁, because their diets are not of suitably high quality. Since the synthetic vitamin is now available in abundance, it is to be expected that the time is not far distant when sufficient clinical observations from its administration will become available to serve as a basis for judgment on this point. The wisdom of providing B₁ fortified milks must await the initiative of the medical profession. It is yet too soon to make any recommendation relative to this matter.

Regarding vitamin A, it is interesting to note that a number of studies

have shown that the new-born have almost no store of this substance, which is extremely important for the health of the epithelial structures. Colostrum is several times richer in vitamin A than is milk, and it seems extremely important that the very young should be fed this vitamin liberally for a time in order to fill up their livers with it. It has been shown that pups require several weeks of suckling in order to raise the content of vitamin A to half the content of the livers of their mothers. For this reason, it would seem that fish liver oil concentrates are better sources of vitamins for addition to milk which is to be taken by the very young infant than are other sources of vitamin A and vitamin D.

In conclusion, it may be reiterated, that the vitaminization of milks with respect to D is of established value. Milk distributors and health officials will do well to delay offering to the public any other kinds of fortified milks until the medical profession asks for them.

REFERENCES

- J.A.M.A.*, Editorial, 97:106, 1931; *ibid.*, 103:493, 1934.
Bunker, J. M., and Harris, R. S. *North East J. Med.*, 211:1140, 1934.

Postgraduate Education of Physicians in Pediatrics*

MYRON E. WEGMAN, M.D.

*Pediatric Consultant, Maryland State Department of Health,
Baltimore, Md.*

ATTEMPTS to provide for postgraduate education of general practitioners have taken many directions. The physician in the city has available hospital clinics, lectures, and staff conferences. He usually has fairly frequent medical society meetings with speakers to cover the newest advances in the various branches of medicine. In addition he has the priceless boon of library facilities. The rural practitioner, on the other hand, unless he is particularly fortunate, has almost none of these opportunities. This deficiency has been recognized and measures have been taken to overcome it. One of the most successful has been the holding of so-called institutes where short intensive courses are given by men of ability. Such institutes, however, must be given at some central point and are intended to attract physicians from a large area. This, of course, entails the necessity of some of the men coming very long distances, and to get any real benefit from the course of lectures, they must remain away from their practices anywhere from a few days to 2 weeks. Such a course is often impracticable for many country practitioners. Although these

institutes have met with excellent response, there still remains a large group of men who are not reached by such efforts and who are entitled to consideration.

In the summer of 1936, Dr. J. H. Mason Knox, Jr., Chief of the Bureau of Child Hygiene, Maryland State Department of Health, initiated a program with regard to pediatrics, designed in part to meet the needs of this group of rural physicians, in more or less outlying areas. A full-time pediatrician was employed, who was to concentrate on one section of the state as a demonstration area.

The district chosen includes 3 counties in southern Maryland, comprising an area of approximately 1,000 square miles. The population is about 40,000 with, roughly, half of the inhabitants colored. The largest single community has a population of 700. Corn and tobacco form the chief income producing crops. A good deal of the farming is done on a tenancy basis and the general economic level is quite low. Although the infant mortality has been declining in recent years, it is still in the neighborhood of 100, with the colored mortality usually about 150 and the white about 80. Only one-third of the deaths may be ascribed to neonatal causes and diseases of early infancy.

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

There are about 25 doctors in practice, varying from 1 to 61 years in experience. Two of the counties have small, fairly well equipped hospitals. Indigent patients in need of special hospital care or clinic consultation must go to Baltimore, 60 to 120 miles distant. Venereal disease, obstetrical, mental hygiene, and orthopedic clinics are held regularly, at various intervals, in all these counties.

The program as designed was to be threefold in object: (1) to provide free consultation service in pediatrics for all patients referred by local physicians, (2) to attempt to increase the local physicians' knowledge of pediatrics, (3) to stimulate lay interest in child hygiene problems. This report will deal primarily with the second of these objects.

The method followed was worked out as follows: All the physicians in the county were interviewed individually, the consultant was introduced and the program explained. They were told that at certain times weekly, the pediatrician would be in the county health office and would be available for consultation. This could be held either in the physician's office, the patient's home, or the health office.

The reception at these first meetings varied considerably, from a hearty welcome to indifference, and in one or two cases, suspicion and skepticism.

After the preliminary meetings the schedule of visits was followed out as planned. As expected, the response was relatively meager and confined to requests from those physicians who had been most cordial. The technic followed thereafter was to make calls at random on the various practitioners and to discuss with them whatever problems might arise during the course of general conversation. By this means many of the physicians were convinced of the sincerity of intentions and honesty of motives of the State Depart-

ment of Health and the pediatric consultant. Almost invariably there would be some discussion of questions of diagnosis and treatment in pediatrics. Often before the end of such a visit the physician would recall a case in which he would like assistance and suggestions, and would make an appointment for consultation the following week. In other instances progress was not so easy and coöperation was secured only after several visits at intervals of a month or two.

It seemed clear from the outset, and the notion has been confirmed in practice, that such a program as this cannot be pushed along faster than the local conditions warrant. General practitioners who have been self-reliant and independent for many years naturally do not like to have new schemes forced upon them. One of the most coöperative physicians at present made no requests for consultation during the first 9 months.

The program as outlined has now been in effect for slightly over a year, of which a goodly part was spent in laying the foundations and securing friendship and coöperation. Evaluation of the results is by no means easy. An appreciable reduction of both sickness and deaths cannot be expected before a considerable time has elapsed. That many individual cases have benefited from the consultations was to be expected. This, of course, is a temporary affair. What has been accomplished of a lasting nature?

Of the 25 physicians in practice in the area about 75 per cent have made one or more requests for consultation. Of the 16 most active physicians only 1 has failed to avail himself of this service. About 250 consultations took place in the first 12 months, with a fairly steady but irregular increase evident. Naturally some consultations have been more fruitful than others. In general the physicians have shown

themselves very willing to accept suggestions and advice, and the resistance to new ideas has been considerably less than anticipated.

There has been no correlation between the number of years in practice and willingness of coöperation. Several of the older practitioners have made very frequent calls for the service.

The crucial test of the value of this method of bringing pediatrics to the general practitioner hinges on how much new knowledge in the field is acquired and retained. Examinations of any sort obviously are not feasible. The sole way to judge would seem to be the impressions of the consultant himself—such impressions being of naturally limited scope. One would like to have similar situations come to the attention of individual physicians so that he might note any changes in attitude or perspective which might be attributed to the influence of a previous consultation or discussion. Unfortunately such an arrangement has occurred but infrequently in the comparatively short experience we have had. Most of the practitioners in the area where this program has been carried out have been in practice for a number of years, have had to depend on themselves exclusively, and have accordingly worked out methods of treatment satisfactory to them for most of the common ailments with which they are confronted. It is asking quite a good deal to expect that they will embrace with open arms the new and often apparently revolutionary ideas of a young man, no matter how well trained. Each practitioner has first to convince himself that the pediatrician's ideas are sound and that his methods work. Nor is it of much help to find the consultant advising, as often he must, that a given case requires specialized hospital care and accordingly must be sent off to the city.

Parenthetically this is a good place to call attention to the almost uniform indifference with which many hospitals treat the busy country practitioner. The patients whom he refers to hospitals are often discharged without any notification to the physician as to further care or follow-up. A letter at the time of discharge would not only be of very great value to the physician in his handling of the individual case but would often be a material help to his understanding of the problem and his approach to similar cases in the future.

The one field in pediatrics where repetition of similar cases might be expected to be frequent and where there is considerable room for improvement is that of infant feeding. It is in this field, moreover, that the most definite evidence of benefit has been obtained. Description of simplified, rational methods of feeding has been welcomed, and such methods, once their value has been demonstrated, have been put into steady use by several of the physicians. The treatment of infantile diarrhea, one of the major causes of infant mortality in this area, has not fared quite as well although some of the physicians have now adopted present-day methods. Both in infant feeding and in the treatment of diarrhea, the consultant has been asked by some of the practitioners to prepare written outlines for their individual use. This has been accomplished with apparent good effect.

Beyond these two large groups of cases there has been a great variety of diseases upon which advice has been asked. In not a few of these the consultant has been at as much of a loss as the referring physician. In others, conditions have been recognized by the consultant and the diagnostic points made sufficiently clear so that on subsequent occasions the general practitioner has done well, unaided.

In the light of the present experience a few disadvantages of this method stand out. There is a relatively large amount of time wasted, chiefly in travel. In order to cover an area of any size and make regular visits to designated points, there are, of necessity, a good many hours spent in driving back and forth. The average weekly distance traveled by automobile has been about 500 miles. There is a further waste in the inevitable waiting around in order to fit the consultant's schedule to the schedules of the local physicians. It is obviously essential to make every effort to have the physician present during the history taking and the examination. With busy practitioners this is not easily arranged. Another disadvantage, related to the first, is the relatively small quantitative return for the investment. A much smaller audience is reached than that possible for formal lectures. In such lectures or hospital demonstrations the subject of children's diseases may be covered in its more important aspects in the space of a few weeks. Of course, such an intensive course cannot hope to clarify all the phases of children's diseases which are discussed, nor can one be sure that the individual physician carries away the important lessons. A further drawback of the present method is the inability to plan the work to cover the field of pediatrics properly, for one must take only what opportunity offers in the shape of patients for consultations.

It is hoped that, after a time, the subjects missed during consultations may be gone into in addresses before the county medical societies. Such talks would be of great help in supplementing the other work but thus far there have been only a few opportunities to make them.

On the favorable side, a few points may be made. The advantages of

having an actual case as a basis for discussion cannot be overemphasized. It is obvious, of course, that in the discussion of any case, no matter how simple, any number of problems may be brought up and gone into. When Jacobi introduced hospital bedside teaching in pediatrics in New York at the time of the Civil War, a great step forward was taken. With the impetus given by Dr. Osler, most of the medical schools in this country soon embraced bedside teaching in hospitals as a fundamental part of the course. Yet we must not forget that before the present era of highly efficient medical schools, the greater part of medical teaching consisted of an older practitioner taking the younger one around and introducing him to the "mysteries" of the art as he made his rounds from patient to patient. The loss of this experience and relationship has not been entirely replaced in our schools, and few would deny that many graduates in medicine go into practice with an inadequate knowledge of pediatrics. Bedside demonstration during the course of consultation is of inestimable value in learning the significance of physical signs peculiar to childhood.

Another advantage on the side of bedside teaching of physicians in practice must not be overlooked. Most of these men are busy, conscientious, overworked and underpaid practitioners. Their problems and difficulties can be appreciated much better by one who actually works with them and sees the "problems" at first hand. It is much more helpful and efficacious to be able to give advice adapted to the exigencies of the individual situation.

The personal contact with the physicians means a great deal. Sound and unsound ideas may be thrashed out with benefit to both parties. Advice and suggestions may be made with proper emphasis and with reasons and

explanations given. The alleged existence of an ultra-scientific attitude on the part of the recent graduate and the specialist may be exploded quickly when the general practitioner has a chance to talk things over with the specialist. In this way some of the reasons for skepticism of the general practitioner toward proved newer methods may be overcome.

One further advantage is to be listed. The cases which form the subjects of the consultations are usually the children of indigent low-income families. These patients certainly derive more or less benefit from the consultations, which up to now have been entirely unavailable to them both because of inaccessibility and expense involved.

SUMMARY

In the State of Maryland, the Bureau

of Child Hygiene has put on its staff a pediatrician to be available as full-time consultant for the general practitioners in a strictly rural area with a high infant mortality.

One of the objectives has been improvement of the pediatric knowledge of the local physicians. This has been attempted through the medium of using the individual consultations as opportunities for discussion and instruction.

Since its inception, there has been gradually increasing coöperation from the large majority of physicians. A total of 250 consultations were made during the first year. It is impossible to assay the results with any accuracy but some benefit has been derived. Advantages and disadvantages of this method of postgraduate education have been discussed.

What Every Health Officer Should Know

Vital Statistics*

JESSAMINE S. WHITNEY, F.A.P.H.A.

Statistician, National Tuberculosis Association, New York, N. Y.

WHEREVER statisticians are gathered together in large or small groups, the conversation ultimately turns on the question of quinquennial census taking. Since all our mortality rates are based on census figures, accurate population data are essential. In a country such as ours where the usual natural increase of the population has been upset by changes in birth rate, cessation of immigration, etc., former methods of estimating population are no longer of value. We have certain statistical tricks which help somewhat in arriving at such estimates in the early years of the intercensal period, but in the latter half we are hopelessly at sea in the whole matter. It is vital to the whole public health field that we become not only articulate in demanding a U. S. Government Census every 5 years, but that we become noisily and unpleasantly vocal on the subject in order to get congressional action.

The ageing of the population is a problem which confronts all vital statisticians today. The rapid decline in the birth rate, the decline in immigration, amounting in some years to an excess of emigration over immigra-

tion, and the saving of young lives through protective health measures are changing the age distribution of the population so rapidly that we may confidently expect an increase in the general death rate in the not too distant future.

This changing age picture necessitates modifications in death rates for comparative purposes. There is need either to standardize such rates for age, or to establish rates on the basis of the age groups of the population most affected by the disease or cause under consideration. For instance, the rates for degenerative diseases would be based on the population aged 45 and over, and the rates for communicable diseases of childhood on the population under 15 or 16.

The recent social welfare movements undertaken by the U. S. Government and various voluntary groups have created a demand for information not now called for in the standard birth and death certificates. Under pressure from such groups many states have been or are making changes to comply with such requests, with the result that there is considerable departure from the original plan to have "standard" certificates in use in all states. So a request was made to all state registrars to withhold, if possible, further changes until a general committee could take up the whole matter

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

and recommend changes acceptable to all. Such a committee is now at work and expects to report next year.

The so-called Registration Area, which has been built up over the past generation, now covers all the 48 states for both births and deaths. We might call this the horizontal or extensive phase of vital statistics registration. Now that that objective has been attained, we are turning our attention to the refinement and improvement of the data reported in what we might call the intensive or vertical phase. One step toward this is the reallocation of deaths to usual place of residence of decedent and in the case of births to usual place of residence of mother. Several states are now doing this routinely to the very great improvement of the resulting data.

Then, too, there is the interchange of death certificates of persons dying in states other than their place of residence. The Vital Statistics Bureau of the U. S. Census is acting as the clearing-house in this procedure. Negotiations looking toward a similar plan with foreign countries are under way and Canada is already exchanging copies of certificates of alien decedents with border states.

Right at the moment the *International List of Causes of Death*, the basis of vital statistics in this country, is undergoing its 10 year revision by a committee of the American Public Health Association preparatory to the decennial meeting in Paris to be held in 1938, when over 40 countries which adhere to this list send representatives to consider revisions and make decisions to stand for the next decade. The United States changes suggested are along the line of reclassifications to meet the newer knowledge in pathology and bacteriology. Also, they attempt to eliminate certain common undesirable designations of disease, and to emphasize acceptable terms.

One of the most baffling problems is the assignment to a single cause a death for which the death certificate certifies more than one cause by the attending physician. Various methods of educating physicians to give their own version of the actual cause of death are being considered, involving some changes in the method of stating the inquiries on the certificate. Differences in handling this so-called "joint causes of death" problem by the various countries invalidates to a great extent comparability of vital data between countries, the very purpose for which the *International List* was established.

The whole question of accident statistics has become a staggering problem. "Deaths from all accidents" is now the sixth leading cause of death in the United States. If our purpose as public health workers is to prolong life as well as prevent disease, serious attention needs to be directed to this field. The Vital Statistics Section at this meeting has passed a resolution calling on Congress and the President for a 2 year appropriation to analyze the whole field of accident statistics, with a view to finding out where preventive efforts can best be concentrated.

I would not wish to conclude this brief presentation without paying tribute to the fine leadership in this field which we have in Washington in the Vital Statistics Bureau of the U. S. Census. With limited appropriations they have begun many innovations which will revitalize the whole field of vital statistics in this country. A small field force stands ready to give advice and counsel to local or state health officials on all matters pertaining to the vital statistics field.

Finally, I would urge you to consider the vital statistician in your department as a pathfinder. He should use the story of events already past to forecast drifts in the future and should

be a vital factor in helping to decide where emphasis in future plans and programs should be placed. Some health departments, both state and local, have expanded his functions and have made him statistician of the entire health department. Bureaus of communicable diseases, of nursing, and laboratory, all have statistical needs, and a well trained vital statistician can serve them all.

If your vital statistician is just a

fellow who sits in a corner and fiddles with figures all day and makes up a lot of complicated tables, the printing of which budget limitations usually prohibit, get rid of him, and get a statistician who can analyze those figures, interpret what they mean for future health work in words of one syllable, one who can really be a pathfinder and thus take his rightful place in the glorious business of life saving in which we are all engaged.

Personal Gifts Needed by Physicians

ON the occasion of the presentation of the prizes at the London Hospital Medical College, Dr. Robert Hutchinson, President of the Royal College of Physicians of London, summarized the qualities needed by a physician for success as follows:¹

First, good health, since there is nothing so tragic as a sick doctor; second, luckiness, though he warns that if one does not have luck, hard work and patience can make up to a great extent for the lack of it. Curiously, he places brains third, and warns that there must not be too many since it is unnecessary and perhaps even dangerous in medicine to be too clever. Extra diligence will make up for any shortage in brains. His next gift is equanimity, the power "to turn a keen untroubled face home to the instant need of things." Equanimity, however, must not be confounded with indifference. Next comes a sense of justice, first to the patient, then to one's self, to one's

professional brethren, and to the profession as a whole. He regards the sense of beauty, his next requirement, not as a luxury but as a saving grace, a compensation for the sordid things which must happen in a doctor's life, and a way of escape—"a sanctifying and steadying influence." This may be displayed in a love of art, music, current literature, or anything which cultivates the higher tastes of life. He places last in his list—though he considers it the best of all—the sense of humor. This prevents one from taking his profession and himself too seriously and will remind him that there are other things in life worth having besides health. This sense cannot be cultivated in solitude. The possession of the senses of justice, of beauty, and of humor will go far to insure the equanimity needed by doctors to face the life they must lead.

REFERENCE

1. *Lancet*, July 9, 1938, p. 61 (Abstr.)

What Every Health Officer Should Know

Industrial Hygiene*

LEVERETT D. BRISTOL, M.D., DR.P.H., F.A.P.H.A.

*Health Director, American Telephone and Telegraph Company,
New York, N. Y.*

IF I understand the mind of the health officer, he is interested primarily in organization, administration, and legislation, rather than in details pertaining to industrial toxicology or various industrial health hazards. Our Section has Committees on Lead Poisoning, Compensation, Volatile Solvents, Skin Irritants, Ventilation, and other allied subjects. The reports of these committees are printed in the *Association Year Book*, reference to which may be made for recent developments along these lines.

ORGANIZATION AND ADMINISTRATION

Possibly the most important development during the last year has been the creation of a Council on Industrial Health by the American Medical Association. This council is now in the process of being organized, and will function as a standing committee of the Board of Trustees of the American Medical Association.

During recent years, in addition to the work which various private industrial organizations have carried on, 3 federal agencies have been active in this field. The Division of Industrial Hygiene of the U. S. Public Health

Service has exerted a stimulating leadership in this field and has carried on scientific studies and promotional work with reference to various industrial health hazards. The Bureau of Mines in the Department of the Interior has carried on studies particularly among the mineral and allied industries, while the U. S. Department of Labor has been instrumental in securing uniform laws, and has carried on important statistical studies.

During the past year or two a marked advance has taken place in the organization of state and local bureaus of industrial hygiene. This advance undoubtedly has been due to the leadership of the Division of Industrial Hygiene of the U. S. Public Health Service, as well as the Committee on Industrial Hygiene of the Conference of State and Provincial Health Authorities of North America.

According to information supplied by the U. S. Public Health Service, the following 22 states at present have divisions of industrial hygiene in their state departments of health: Alabama, California, Connecticut, Illinois, Indiana, Iowa, Kansas, Michigan, Mississippi, Missouri, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia and Wisconsin. In 2 states

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

(New York and Massachusetts) such bureaus are established in the state departments of labor.

In addition to the development of such divisions in state departments of health and labor, 4 cities have inaugurated such divisions of industrial hygiene in their city departments of health, namely, Baltimore, Detroit, St. Louis, and San Francisco.

DEMAND FOR TRAINED PERSONNEL

One result of the marked advance in the development of Bureaus of Industrial Hygiene in state and local units has been an increased demand for trained personnel which it has been difficult to meet. This emphasizes the need for a more comprehensive program of teaching industrial hygiene in medical and public health schools throughout the country. In a survey which I made two or three years ago, it was found that only 13 out of 85 medical and public health schools in the United States and Canada give separate courses on industrial hygiene or industrial medicine. Several medical schools include one or two lectures on this subject in their general course on preventive medicine and public health, while a considerable number of such schools give no attention whatever to this important and growing subject.

COMPENSATION FOR OCCUPATIONAL DISEASES

The following 13 states now have compensation legislation covering a limited list of specific occupational diseases: Kentucky, Minnesota, Nebraska, New Jersey, North Carolina, Ohio, Rhode Island, West Virginia, Washington, Indiana, Pennsylvania, Michigan and Delaware. Eight states (Connecticut, Illinois, Missouri, New York, North Dakota, California, Massachusetts, and Wisconsin) have blanket provisions with more or less general coverage of diseases arising out

of or in connection with employment.

There is no question but that compensation legislation covering industrial accidents led to a rapid increase in safety activities throughout various industries of the United States. It is equally certain that the increasing legislation adding occupational diseases to the compensable list will further stimulate the development of industrial health promotion and sickness prevention.

REPORTING OF CASES OF OCCUPATIONAL DISEASES

The following 21 states now require the reporting of occupational diseases to state authorities: Alabama, Arizona, Connecticut, Georgia, Illinois, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Rhode Island, and Wisconsin.

INDUSTRIAL HEALTH APPRAISAL

The appraisal idea, which has been applied in past years to city and rural health units, recently has been extended to the industrial health program, and a Sub-committee on Industrial Health Appraisal of the Committee on Administrative Practice of the American Public Health Association is now engaged in furthering this plan. A paper by E. L. Simonds and E. R. Dejon, presented before our Industrial Hygiene Section at this meeting, indicates the views of one industrial organization which for the last 4 years has put the *Industrial Health Appraisal Form* into use as a regular company routine. It is hoped that other industrial organizations may see the value of applying the appraisal principle to their industrial health programs in the future.

ORGANIZED RESEARCH

In addition to research in industrial

hygiene now carried on by various governmental units and by many industrial organizations, there has been some recent development of special groups for organized research, including such agencies as the Air Hygiene Foundation of the Mellon Institute in Pittsburgh, and the Laboratory of Industrial Toxicology, of the DuPont Company in Wilmington, Del. In addition to these, one or two of the larger universities are now considering the development of special research institutes on industrial hygiene, with the idea of developing coöperative activities between local industries and university faculties.

INDUSTRIAL HYGIENE SECTION

The all-inclusive interests of the Section on Industrial Hygiene of the American Public Health Association may be noted by referring to the program of the current Section meetings, which covers, among others, such subjects as "Syphilis Control in Industry," "A Symposium on the Heavy Metals," "Lead Poisoning," "The Importance and Diagnosis of the Industrial Dermatoses," and "Vaccines Against the Common Cold."

In conclusion, attention should be called to recent significant experiments carried on by a group of research workers at the University of Toronto. Although these experiments are of a tentative and preliminary nature, it would seem that tiny traces of aluminum dust, added to the dusty, silica-filled air breathed by certain classes of miners, may some day stay the ravages of silicosis. In this study the addition of small quantities of metallic aluminum dust almost completely inhibits the solubility of silicious materials in laboratory beakers, and rabbits dusted with quartz to which less than 1 per cent of metallic aluminum dust had been added, showed practically no lung fibrosis, which is one of the characteristic pathologic findings in silicosis; while control rabbits dusted with quartz alone showed well developed silicosis. If these preliminary experiments are subsequently confirmed by other research workers, and are found practicable from the standpoint of the prevention of human silicosis, the time may come when the funeral ritual, "Dust to dust" may be adapted as a slogan by the industrial hygienist to read, "Dust *for* dust"!

What Every Health Officer Should Know

Health Education*

MARY P. CONNOLLY, F.A.P.H.A.

*Director, Division of Health Education, Department of Health,
Detroit, Mich.*

PUBLIC health education is beginning to be recognized as an important tool rather than a decorative feather in the cap of most health organizations. This change has been brought about by health officers as well as by better prepared health educators who together are studying the problems of their communities and the means by which many of them can be solved through education.

A marked change has taken place during the last 10 years in viewing the possibilities of health education. Health education started as a missionary movement—a way by which individuals, by certain practices, could work out a health salvation for themselves. A number of things were found to be wrong with the movement. First, but with few exceptions, there is no general rule for reaching the healthy life which can be applied to all persons; second, there are few personal practices which will do much to maintain health without medical guidance. This knowledge has shown the limitations of the earlier conception of health education and has opened up a vista which is as wide as the health officer cares to make it.

There are two schools of thought in

relation to the presentation of health material. One would employ the commercial technic, and the other regards this approach as unworthy of the serious subject and its effect upon the lives of many. Commercial technic is effective if it is modified and considers that men and women will pay for an article readily, while they change their habits only after much consideration and prayer. Then, too, the market for commodities assumes new fashions, while the health needs of a community change less rapidly. If the buyer finds that an article has been advertised as having virtues that he finds lacking, he will buy another product the next time. If he has been misled regarding the results of health practices he becomes a ready victim for the charlatan and the cults, and opposed to the whole system of scientific health protection.

Generally speaking, no two communities will respond to the same type of approach, any more than will all sections of one community respond in the same way. This means that to make a program effective many kinds of media will have to be employed at the same time. The newspaper and radio likely will affect about 20 per cent of a given community, and the other 80 per cent will be left untouched by these means. The health officer who relies upon a newspaper man alone to

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

tell his story to the public will find that a large part of the population is not being impressed. The same will be found true when radio, or printed material, or group meetings are used exclusively.

As a result of a better understanding of the various avenues of approach necessary, few communities are boasting of results obtained by educational

Any health officer who wishes to sell public health to his community will have to start with a sound approach. This means that he must be sure that the material which he presents is scientifically honest, that it is vital to his community, and that he has facilities available for the residents to accept his advice. This is particularly important if he wishes to eradicate tuberculosis or syphilis. Perhaps his program is being presented to enable him to obtain these facilities. If it is, his approach will be different from that made when facilities are available. However, once the facilities are obtained, good practice dictates that a purely emotional approach will accomplish little without sound education disseminated by every possible means.

Syphilis programs are claiming the attention of most health departments today, and well they may. Those whose job it is to influence public opinion are concerned with the form this education will take, and whether some of the programs proposed will only continue the emotional response to the efforts. Syphilis is a communicable disease and education regarding it must take into consideration the rather sketchy ideas most persons have regarding the communication of disease and the need for supplying some basic education on which to pin specific education regarding syphilis. Consideration must also be given to the problem in a given community. Residents of homogenous communities in which public health

has been promoted are not moved to action by the knowledge that 40 per cent of certain racial groups are found to have syphilis. The more favored groups will assert that "it can't happen here," and go merrily on their way. Large sums of money are being appropriated for syphilis control and health educators will have to show some results for its expenditure.

The person employed today to do health education for a health department must know something of public health problems, sociology, economics, the interpretation of vital statistics in relation to population make-up, as well as advertising, salesmanship, journalism, and pedagogy.

Some few of the schools are making an attempt to provide this education for students. The report of the Committee on the Professional Education of Health Educators shows that serious consideration has been given to the preparation of the hybrid person who is to interpret the findings of science and the laboratories to the everyday man. The wise health officer will expect the same professional standards from his health educator that he expects from his epidemiologist or his director of nursing.

The first step in any health education program should be made with the employees of the health organization. Every health department has many non-professional employees—inspectors, clerks, stenographers, and others who are concerned with routine activity. These people can be of great value in promoting the program, or they can destroy the sincere efforts of the health officer and the health educator. The inspector who tells all and sundry, in and out of work, that he would not have his children protected against diphtheria, has no place in a modern health department if his opinions cannot be changed. Intensive education for all employees which will make them

feel important messengers of the program pays big dividends.

The Fuller Brush man is still keeping a good part of the country supplied with brushes and brooms. He goes from door to door and brings his wares to the people. The public health nurse brings the public health program to those who would never know of it in any other way. She is the salesman who must take the time to discuss the merits of the suggested practices, to listen to the objections, and within the limits of environment show the family the advantages of preventive medicine. She will be successful if she has learned the educational approach and the motives which will cause persons to accept what she has to offer.

Physician preparation is the next step. No wise merchant would buy a page of advertising in the *Saturday Evening Post* without first being sure that his product is understood and for sale by the retailer. The practising physician is the purveyor of preventive medicine. Unless he is kept informed and made an active part of the program, he will likely discredit the effort because he is not ready to dispense the service. The local medical society provides the best means for reaching the physician, and its official sanction gives a coöperation which cannot be obtained in any other way.

Those who influence public opinion are important allies of a health department and deserve to receive information before the program is given to the public. The clergy of all denominations, teachers, social workers, club members, and others who feel that their word counts, will influence many persons and establish constructive attitudes toward public health problems.

The attention of the press will come when the health department has something to offer. Newspapers want news which will be read. The modern health department is teeming with news

of vital interest to every person in the community. The vital statistics gathered by the health department are a record of the joys and sorrows of the people. If they are interpreted intelligently to the press, they form a base on which much health information can be built. The persistent reporter who wants to know the why of things is not being just annoying. He is trying to find the answer to the countless questions which will come to his readers from the simple statement of facts made by the health officer. If he is given an honest picture of the situation, with enough details to help him to understand it, rarely will he betray the health officer. If on the other hand, he is given a garbled account which endeavors to cover inefficiency or lack of knowledge, the health officer may well fear the worst.

The radio offers a medium which reaches many homes. The health message is padded between commercial programs for which all sorts of attention-getting devices are used. The health message must be unique and refreshing and arrest attention without being blatant. Real skill is necessary to accomplish this. Real personalities are needed to convey the message.

Literature is valuable if it is carefully prepared, well printed and illustrated, and distributed with discrimination. Very few health departments have a sufficient budget to buy quantities of good literature, and the American Medical Association, American Public Health Association, national health organizations, the insurance companies, and a few other commercial concerns, prepare and distribute pamphlets which may be used by health organizations. The insurance companies produce the best of the commercial literature which usually is prepared by scientific writers and which does not aim to sell a specific product. There are some duplicating

machines and other devices which may be used by the health organizations to prepare material which has local significance. With a certain amount of ingenuity and a small budget, much can be accomplished by the organization personnel.

Person to person education is important and requires an endless amount of time, but the results repay the effort.

The success of health education will depend first upon the standing of the health organization which promotes it, and the sincerity of purpose which it has established; and then, upon the preparation and adequacy of the health educator and the coöperation which he receives from the entire staff.

The day of policing is pretty well over for public health organizations. It is being replaced by sound education by which the community will be able to make decisions which have social value.

One of the most urgent needs in

health education today is a technic for evaluating programs as a whole, and then the constituent parts of the program in order that the greatest results may be obtained from the expenditure of money available. A committee within the Public Health Education Section is studying methods of evaluation and it is hoped that some worthwhile recommendations will come from this meeting. The Committee on Objectives likewise will report on efforts to clarify the relationships of public health educators, school health educators, and the countless other persons who find health education a part of another job for which they were employed.

Public health educators are realizing their responsibilities, their need for understanding the problems of human beings in relation to health, and the best means by which persons may learn to solve these problems.

What Every Health Officer Should Know

Public Health Nursing*

NAOMI DEUTSCH, R.N., F.A.P.H.A.

*Director, Public Health Nursing, U. S. Children's Bureau,
Washington, D. C.*

IT would seem appropriate to begin a review of recent developments in public health nursing with a discussion of activities in the field of public health nursing education, since this is fundamental to all public health nursing activities.

In December, 1918, the Rockefeller Foundation invited a group of nursing educators, physicians, public health nurses, and individuals eminent in the field of public health and social research to consider this topic. "The proper training of public health nurses" was the problem presented to the committee. The study upon which this group embarked, under the chairmanship of Josephine Goldmark, has been generally known as the Goldmark or the Rockefeller Report on Nursing and Nursing Education in the United States. Soon after this study began it became clear that, if sound conclusions were to be attained, the entire field of nursing had to be taken into consideration.

In preparing to solve the problem confronting Miss Goldmark and her committee, namely, that of meeting the need for more adequate nursing serv-

ice in the field of public health, an analysis of the basic professional education was found to be of paramount importance. Although the Goldmark report was followed by illuminating surveys conducted by the Committee on the Grading of Nursing Schools, the program in the basic professional education for public health nurses is still a challenging problem. In reviewing professional histories public health administrators still find applicants with inadequate basic nursing preparation.

If the Curriculum Guide for Schools of Nursing, prepared by the National League of Nursing Education and published in 1937, could be put into universal practice, nursing education would be fundamentally improved. In this, increased emphasis is given to the social and the economic aspects of health and disease. Teaching methods are given the prominence they deserve. In the past nurses have relied largely on content to guide their teaching and have not always known how to stimulate and encourage the individual to acquire health knowledge and to put it into practice.

Not until there is a complete separation of the responsibility and the budget for hospital service from those for the school of nursing will this broader concept of nursing education

* Read before the Health Officers Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 7, 1937.

be realized. Tax appropriations or educational endowments are needed to make a high standard of professional nursing education more universally available. There is increasing agreement that the requirements for entrance to the school of nursing should include a broad and sound preliminary education.

Although the Rockefeller Report was published as early as 1923, it gave as a part of its first conclusion that as soon as practicable all agencies employing public health nurses should require a postgraduate course in public health nursing. The survey of public health nursing made by the National Organization for Public Health Nursing in 1932, and published in 1934, shows from a sampling of urban and rural public health nursing service that only 7 per cent of the public health nursing staff, not including supervisors and executives, had completed an accredited course in public health nursing. A study made 5 years later, in 1937, and as yet unpublished, shows that 29 per cent of the nurses employed in the official agencies studied had completed an approved course.

Although this is a gratifying increase, the demand for public health nurses meeting the minimum requirements for public health nursing positions as set forth by the National Organization for Public Health Nursing still greatly exceeds the supply. Stipends granted by state health departments to candidates for preparation in public health nursing have played a large part in increasing this number. That the problem of further preparation for staff nurses and potential staff nurses is still a large one is evidenced by census figures for public health nurses, which have been compiled by the public health nursing consultants of the U. S. Public Health Service and the U. S. Children's Bureau. On January 1, 1937, 21,656 public health nurses were employed by

official and unofficial agencies in rural and urban areas.

Curricula in public health nursing are now offered in 17 universities and colleges throughout the country. At a conference on public health nursing education held at the U. S. Public Health Service in Washington, D. C., on April 1, 1937, at which directors of courses in public health nursing and consultants from the U. S. Public Health Service and the U. S. Children's Bureau were present, the following statements were made with regard to the qualifications of students on stipend who attend these courses:

1. The majority of students on stipend met the matriculation requirement of the respective universities; the exception to this was a group of Negro nurses attending a special curriculum.
2. The current selection of students by the state health departments was superior to the previous selections. The greatest value from the period of study can be attained only if the student has satisfactory background and has demonstrated her ability and general aptitude for public health nursing.
3. The personal qualifications of the applicant as they influence her competence for the public health nursing field should be carefully considered.
4. It is desirable that students should have had an introduction to public health nursing through experience in visiting nursing.
5. Preference in granting stipends should be given to candidates having had an adequate clinical preparation.

With regard to the curriculum the group stated:

1. There should be close correlation between field practice and theory.
2. It is recommended that in both theory and field practice the promotion of health, the prevention of disease, and the nursing care of the sick be emphasized, since increasing emphasis is being given to comprehensive community public health nursing services.

The outstanding needs in public health nursing education were given as:

1. Basic nursing preparation of the student should be improved; if necessary it should

be supplemented before formal training in public health nursing is begun.

2. The establishment of additional facilities in conjunction with the health department for supervised rural field practices is essential to meet the needs of the increased student group.

3. Opportunities for advanced preparation in control of syphilis, control of tuberculosis, orthopedic nursing, and maternity nursing should be established under the direction of university departments of nursing education.

In order that this additional preparation of the public health nursing personnel may result in improving the quality of performance, supervisory and advisory services are playing an increasingly important part in the administration of public health nursing. Under the auspices of Western Reserve University and the National Organization for Public Health Nursing two conferences on supervision of public health nurses have been held for supervisors in the Midwest.

"Teaching on the job" by supervisors is a necessary corollary to adequate staff preparation. The increasing demand for supervisors prepared to do this is a significant development.

Throughout the country public health nursing services have been increased and extended, especially in rural areas, through grants-in-aid to the states under the provisions of the Social Security Act. Nursing programs are not being enlarged as a separate entity but as one part of the community public health plan. New objectives in the general health department program are reflected in the nursing services. For example, in certain areas reports of activities indicate that public health nurses are including programs for the control of syphilis and pneumonia in the general family health services. In some of the programs promotion of better nutrition is being stressed. The nurses' knowledge of this subject is being enriched and the program guided by special consultants in nutrition.

Several private agencies are studying ways and means of improving the nursing service for patients having chronic diseases.

Public health nursing services in school health programs are being more closely integrated with courses of study and with the activities of the teaching staff.

The increasing demand for a more complete maternity program is directing attention to rural areas that have established nursing services in the home during delivery. Varied methods of administering these services are being inaugurated. When these are compiled and analyzed, important data on administrative practices in home delivery nursing services should be available.

Locating crippled children, assisting with arrangements for their hospital care, and assuming greater responsibility for their after-care are developments in the local nursing program.

As more opportunities for social and health services in the community are developed, public health nurses are becoming increasingly aware of the need for establishing definite relationships with workers in the fields of nutrition, social work, mental hygiene, and education, so that the varied programs may achieve their common goal of better health and social security for the community.

In the American Public Health Association the Public Health Nursing Section seeks to integrate its activities with those of other sections and to interpret underlying principles and current trends in the practice of public health nursing and in turn gain knowledge concerning the activities of other groups. The section is closely identified with the National Organization for Public Health Nursing, which is the standard and policy making organization for the profession. The American Public Health Association's Public

Health Nursing Section promotes these standards through the activities of its committee members. Public health nursing is represented on the four Standing Committees of the Association. Throughout the past year section sub-committees have been appointed to study relationships between official and nonofficial public health nursing agencies; to study the function of the Public Health Nursing Section in its relation to other national organizations; and a committee was appointed to define public health nursing problems needing research and study.

TO SUMMARIZE THE DEVELOPMENTS

There has been an extension in the facilities for public health nursing education. A curriculum guide for schools of nursing has been published which should favorably influence basic nursing education. There has been an increase in the number of public health nurses who have completed an accredited course in public health nursing.

Following the expansion in the public health program, nursing services have developed more comprehensive, well balanced activities, including in certain sections programs of syphilis and pneumonia control, greater stress on

teacher participation in school health programs, more complete maternity programs emphasizing nursing care at delivery, postpartum services, and care of the sick in rural areas. The greater number and improved quality of supervisory and advisory nursing services give planned direction to these expanding services.

The National Organization for Public Health Nursing as the professional organization for public health concerns itself with standards in all aspects of public health nursing. It is the center for pooling and interpreting information, and it gives direction to the developments in this field, guiding the advancement in public health nursing through committee reports, meetings, and publications.

By participating in joint activities the Public Health Nursing Section of the American Public Health Association interprets these standards and principles to the allied groups represented in the various sections of the Association. Through this relationship the public health nursing group gains knowledge of developments in other fields, thus aiding the extension and progress in public health nursing services.

Federal Facilities to Expedite Emergency Sanitation Measures*

R. E. TARBETT, F.A.P.H.A.

*Senior Sanitary Engineer, U. S. Public Health Service,
Washington, D. C.*

THE Ohio River flood of 1937 was the first instance of a major catastrophe in which immediately available federal funds and personnel permitted the expediting of emergency sanitation measures, and in which there was thorough coördination of all federal facilities in connection therewith.

The availability of federal relief appropriations for organized work relief projects in the area affected and the possibility of immediate transfer of these funds, and personnel, to flood emergency activities were conditions which may not and probably will not exist when the next catastrophe of major proportions occurs. In considering the availability of federal facilities, therefore, immediately available emergency funds for labor, materials, and the like must not be included to any appreciable extent. However, trained personnel to assist the state and local health agencies will be available in the future as was the case during the recent flood.

A brief description of the administrative procedures in Washington, with some comments, will indicate that these procedures were the logical and perhaps the best ones to be followed in

any major catastrophe. That there was some lag in their establishment is true, as is also the fact that their establishment was due in part to lack of coördination of flood emergency activities in the field.

In any flood emergency several activities must be carried on simultaneously by various agencies. In order to be most effective there should be a clear understanding by each agency of its duties, if overlapping on one hand, or failure to carry out certain functions on the other, are to be avoided. Likewise, where the duties of two or more agencies dovetail, proper coördination is necessary. At certain stages of the emergency certain lines of endeavor temporarily assume greater importance than others, a fact that all agencies should recognize.

The need for delineation of federal activities, as well as proper coördination, was recognized soon after the probable magnitude of the flood was realized.

On Sunday, January 24, at the direction of the President, the heads of the various federal agencies in any way connected with flood emergency activities met at the National Red Cross headquarters. At this first meeting the duties of each agency were determined, as well as the manner in which each could best coöperate with the other. In this coördinated effort the National

* Read at a Joint Session of the Conference of State Sanitary Engineers and the Public Health Engineering Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 5, 1937.

Red Cross was considered as having the same status as a federal agency. Each agency's representative in Washington became the liaison officer between his agency and all others and had power to act for his agency without the necessity of higher approval. Regular meetings were held daily by this group until the emergency was past.

Following each meeting the field officers in the flood area were advised accordingly. Through this emergency committee difficulties arising in the field were quickly settled and good co-ordination of activities was brought about.

In the future it would appear desirable to assemble promptly such a federal committee whenever a catastrophe may be impending in order that the emergency work may progress as smoothly as possible from the start. While it is important that such a federal emergency committee assemble promptly, it is much more important that similar state committees be organized and be prepared to function much as did the federal committee during the recent flood.

As soon as it was evident that the flood was to reach extraordinary proportions an engineer officer of the Public Health Service was assigned to each of the state health departments in the flood area to coöperate with them. This was promptly followed by the assignment of all available engineers in the Service to flood duty. At the same time arrangements were made hurriedly by the Public Health Service to furnish biologic supplies as needed.

At the meeting of the federal agencies on Sunday, January 24, the Works Progress Administration requested that Service engineer officers be detailed to act as technical advisers in connection with sanitary work carried on by that organization and also to act as liaison officers between the WPA and the state

and local authorities. Under certain limitations Civilian Conservation Corps personnel was made available to the Public Health Service by the Army for sanitary work. Immediately after the meeting the engineer officers assigned to state headquarters were informed as to their duties as technical advisers and liaison officers in connection with sanitary work.

It was also arranged that Service medical officers would act as liaison officers between the National Red Cross and the state health authorities. Medical officers were promptly assigned to the various district headquarters of the Red Cross.

With this arrangement there was a close "tie-in" between the state health departments and the federal agencies engaged in the health and sanitation work which is believed to have contributed to the rapid progress of the work with relatively little confusion.

It was evident at the start that some confusion existed in the supplying of biological supplies. A Service officer was therefore placed in direct charge of this work. He was in touch with all of the possible sources of biological supplies and was able to have them supplied with the least amount of trouble.

It was thought that some difficulty might arise because of the demand for chlorine and chlorine compounds, and a somewhat similar scheme was set up under one of the engineer officers. It was found, however, that the chemical companies had the field well covered and this service was not necessary.

It was realized that as the flood waters began to recede trained sanitary engineers would be needed to supplement the state forces and to act as technical advisers to the WPA district administrators. It was rather essential that such engineers be trained in state health department procedure, since no training and little or no

supervision could be given prior to their employment or while they were on the job. It was also essential that, to be of greatest assistance, these additional engineers be in or near the flood area ready for call. This group was recruited from the state health departments of states adjoining the flood states. Each of the state health officers was called by telephone and asked if he could furnish engineers from his staff and how many. The selection was left to him. Where men were urgently needed at the time of the call he was requested to get them off by the next train. The men taken on were made Collaborating Sanitary Engineers in the Public Health Service and paid a small salary in addition to the regular travel and subsistence allowance for government employees. Under this arrangement no financial loss was suffered by these volunteers and thus there was no incentive or desire to return home before their services could well be dispensed with.

At all times there were engineers on the call list ready for prompt departure to any area in which they might be needed.

This plan worked so smoothly and efficiently that it is questionable if it could have been improved upon. The time elapsing between the call to the state health officers and the departure of the men was only a matter of 4 or 5 hours, even though some requests for personnel were made after 10 P.M.

In addition to the 25 engineers from the Public Health Service assigned to the states affected, 37 were obtained from state health departments, 3 from one city, and 1 from a county, a total of 66. One consulting engineer with health department experience volunteered his services and was added to the force.

It has been suggested that a reserve corps of sanitary engineers be established who would be available on call

for emergency duty. Under the law it is possible for the Public Health Service to offer reserve commissions to engineers, but not possible, however, to call such reserve officers to duty for training at regular intervals.

At first thought it would appear desirable to have a reserve corps to supplement the regular corps of the Public Health Service in times of widespread disaster. There are, however, disadvantages which would appear to outweigh the advantages. One advantage claimed would be the rapidity with which the reserve corps could be mobilized. Theoretically this would be the case while actually it probably would not. Certainly mobilization of any group could not have been more rapid than was the case during the recent disaster when the state health officers designated their assistants who could, and would, go.

With a reserve corps there would of necessity be different grades with different rates of pay. During an emergency the work of all would be substantially the same. Attempting the same work with officers of different grades and rates of pay is not conducive to efficiency. Reserve officers on active duty would receive only a mileage allowance while in a travel status. This allowance would have to cover all of their travel and subsistence expenses. The distance travelled by any reserve officer would be relatively short, and his mileage allowance small; hence he would find, after the first few days, that his expenses were being paid by himself. This would not contribute to either efficiency or willingness to remain until the officer's services were no longer needed.

These and other reasons make it undesirable to attempt to establish a reserve corps for occasional disaster emergency duty.

In order that emergency sanitation measures may be carried out rapidly

and efficiently in any catastrophe such as a major flood there are required labor, supplies, equipment, and transportation, in addition to properly trained technical personnel. These must generally be obtained through other agencies than the health departments. It is desirable therefore that all agencies, both federal and state, promptly organize a committee which will define the activities of each agency and coördinate these activities in such a manner as to promote efficient performance.

In the field of sanitation the Public

Health Service might well be considered the source from which the state health departments would draw technical personnel necessary to supplement their own forces, the Public Health Service to draw upon the states not affected for additional personnel when its own becomes exhausted. In addition to assisting the state health department the engineers furnished by the Public Health Service would act as liaison officers between any federal agencies engaged in sanitary work and the state health authorities and also act as technical advisers to such federal agencies.

Discussion

J. K. HOSKINS, C.E.

Senior Sanitary Engineer, U. S. Public Health Service, Cincinnati, Ohio

THE general coördination of federal facilities for emergency sanitation measures in effect during the Ohio River flood of 1937 has been outlined by Mr. Tarbett. That they could be improved upon in some respects is doubtless true but that they worked with reasonable efficiency and promptness over an extensive area is also certain. So far as the observations from those of us in the field could determine, the extent of coöperation with state and municipal authorities was quite complete.

The general plan of the Public Health Service, in so far as the sanitation activities were concerned, was to:

1. Assign one of its sanitary engineers to each state affected by the flood to collaborate with the chief engineer of the state and through him make available federal facilities for sanitation operations.

2. Be prepared to meet all reasonable requests for emergency engineering and scientific personnel submitted by the field sanitary engineers.

3. Establish only broad policies of procedure and rely upon the field directors to employ measures best suited to handle the particular problems encountered.

4. Remove so far as possible administrative restrictions that might tend to delay immediate action.

There are 3 principal classes of assistance needed in emergency sanitation work that can, to a large extent, be planned for in advance. These are:

1. Directing and scientific personnel
2. Emergency labor
3. Materials, supplies and transportation

Sanitary engineering personnel and other professional assistance was generally adequate and promptly available as a result of the action of the state health officers in placing members of their forces at the call of the Public Health Service. The men selected were trained in state sanitation activities and quickly gained the confidence of local authorities in the areas to which they were assigned.

Emergency labor was generally readily obtained from federal organizations but, as Mr. Tarbett points out, such a reservoir of assistance may not be always at hand. Planning for such emergency help in future disasters would seem to be a function of state

and local agencies. It should be possible for states to work out feasible arrangements with state and county welfare departments through which labor could be quickly supplied and paid. Definite plans for the rapid assembly and assignment of sufficient labor for the protection and reestablishment of the essential public services would materially lessen disaster losses. A well organized and trained reserve corps of labor foremen designated for particular duty on emergency call within the state for each county or other unit would be of especial value. Periodical relief of such workers is also a prime essential as is also provision for their remuneration. An emergency fund for such purposes might be established or arranged for through suitable legislation or at least authority granted for use of the regular state allotments to spending agencies with the promise of reimbursement. The designation of some one state official for the management and arbitrary control of such emergency funds would probably be advisable.

Obtaining necessary materials and supplies quickly is generally a difficult procedure in times of disaster. Federal agencies were particularly helpful during the 1937 flood, especially the Works Progress Administration because of its well organized purchasing department, throughout the inundated area. There are, however, definite restrictions imposed upon federal expenditures. Here too state and municipal governments might give thought to plans for ascertaining sources of essential emergency equipment and perfecting methods for their procurement when needed. Established purchasing authorities, if empowered to act with the minimum restrictions in times of

disaster, could avoid wide confusion and indiscriminate and duplicate buying. An essential of such a centralized procurement agency is the prompt establishment of a representative with adequate assistance at the scene of the disaster, and with adequate authority to act. The close coöperation of such an agent with federal organizations that may be engaged in emergency relief measures is an obvious advantage.

Transportation facilities are generally disrupted in any extended catastrophe. Highways to the affected area are likely to be destroyed or rendered impassible, railroads are equally vulnerable, and other methods of transport affected. As a result our highly specialized systems of food distribution are upset and essential supplies are difficult to obtain. Here again careful planning could alleviate much distress in the early periods of disaster. Certainly the water and sewage treatment plants should have ample reserve supplies of essential chemicals, fuel, and standby power always available to meet any reasonable, unforeseen requirement. Standing arrangements with bus and truck owners for emergency use of their rolling equipment would insure the prompt movement of essential sanitary supplies.

In general, it is believed, the individual states coöperating with county and municipal authorities could, with profit, give consideration to the development of plans for the putting into force of emergency sanitation measures and the reestablishment of sanitary services disrupted by flood and other disasters within their boundaries. The present provision of emergency labor, supplies and materials under competent direction are essential parts of such a program.

Scarlet Fever Control*

EDWARD R. KRUMBIEGEL, M.D.

*Director, Bureau of Communicable Diseases, Health Department,
Milwaukee, Wis.*

TO determine what assurance of clinical protection the 5 standard injections of scarlet fever toxin offer a person if originally Dick positive, the attack rate among immunized persons should be compared with the attack rate among persons known to be Dick positive but unimmunized, and both groups should be studied over an identical time.

On March 12, 1934, the Milwaukee Health Department adopted the procedure of the Scarlet Fever Committee for Dick testing persons over 18 months of age, and the subsequent immunization of those showing a positive reaction. Opportunity has been afforded to observe the result of this work covering a time during which the incidence of scarlet fever has been exceptionally high, reaching epidemic proportions in 1934 and 1935. In 1934 there were given and read 15,642 Dick tests, of which 10,500, or 66 per cent, were positive. Among these Dick positive reactors 1,769 received no toxin for immunization, while 6,497 received in 1934 either a standard 5 dose course or as many doses as they elected to receive. None of these subsequently received any artificial immunization. The 5th dose of toxin was received by

3,914 persons, of whom 3,532 had a re-Dick test and appeared for reading. Of these, 240, or 6.9 per cent, were positive and 183 received a 6th dose (5th dose repeated).

Table I shows the relationship between the positive Dick reactors of 1934, the amount of toxin in doses received and completed in 1934, and the incidence of scarlet fever following completion of the course of immunization. All cases have been followed through March 12, 1937.

TABLE I
*Positive Dick Reactors Developing
Scarlet Fever*

<i>Dosage</i>	<i>Total</i>	<i>Developed S.F.</i>	<i>Case Rate Per cent</i>
0	1,769	226	12.77
1	682	42	6.16
2	462	21	4.55
3	765	21	2.74
4	674	6	0.89
5	3,731	33	0.88
6	183	2	1.09

Among Dick positive reactors there is a progressive decline in the percentage developing scarlet fever, from

NOTE: Throughout this paper the term scarlet fever is used to represent this disease with rash, as the clinician ordinarily reports it. Only a small percentage of the scarlet fever cases reported to the Milwaukee Health Department are *scarlatina sine eruptione*. The relationship between immunization and "scarlatinal sore throat" will be discussed in a future paper.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-sixth Annual Meeting in New York, N. Y., October 6, 1937.

12.77 per cent in the unimmunized group to 0.88 per cent in the 5 dose group. Over 3 years the case rate was more than 14 times higher in the former group than in the latter. The case rates for the 4, 5, and 6 dose groups closely approximate each other.

In order to determine whether the immunity derived from toxin is lasting, Table II is presented. In it the groups from Table I are divided into yearly periods to show the time of development of scarlet fever after the Dick test or the last dose of toxin.

tion of scarlet fever. In reality, many of the unimmunized Dick positive reactors developed immunity spontaneously through sub-clinical attacks of the disease. The theory of latent immunization through sub-clinical infection is strongly supported by observations of Zuger¹ and Gordon *et al.*² To evaluate the influence of latent infection on the comparative figures it would be necessary to retest these same unimmunized positive Dick reactors each year. Immunization through sub-clinical infection would

TABLE II
Positive Dick Reactors Developing Scarlet Fever

Dosage	Total	Scarlet Fever 1st Year		Scarlet Fever 2nd Year		Scarlet Fever 3rd Year	
		Total	Case Rate Per cent	Total	Case Rate Per cent*	Total	Case Rate Per cent*
0	1,769	147	8.31	46	2.84	33	2.09
1	682	21	3.08	11	1.66	10	1.54
2	462	9	1.95	6	1.32	6	1.34
3	765	13	1.70	5	0.66	3	0.40
4	674	4	0.59	2	0.30	0	0.00
5	3,731	14	0.38	11	0.30	8	0.22
6	183	0	0.00	1	0.50	1	0.50

* Case rate percentages have been corrected for the number presumably developing immunity during each preceding yearly period because of contraction of scarlet fever.

The advantage which the various dosage groups have over the no dose group during the first year wanes when compared for the 2nd and 3rd years. For example, while the ratio of case rates for the no dose and 5 dose groups is nearly 22 to 1 for the 1st year, it is only $9\frac{1}{2}$ to 1 during the 2nd and 3rd years. At first glance it appears that the immunity diminished greatly in the 5 dose group toward the beginning of the 2nd year. While it is possible that many of this group who lost their immunity did so within a year, the above figures would require that over 50 per cent did so. It must, however, be remembered that the no dose group table is corrected only for those presumed to have developed immunity in each year through contrac-

tion of scarlet fever. In reality, many of the unimmunized Dick positive reactors developed immunity spontaneously through sub-clinical attacks of the disease. The theory of latent immunization through sub-clinical infection is strongly supported by observations of Zuger¹ and Gordon *et al.*² To evaluate the influence of latent infection on the comparative figures it would be necessary to retest these same unimmunized positive Dick reactors each year. Immunization through sub-clinical infection would

exert its greatest influence in the 1st year during which scarlet fever was prevalent in epidemic proportions. By comparing case rates for the various dosage groups with the no dose group for the 2nd and 3rd year, no waning of immunity is detected for the 3, 4, or 5 dose groups, while definite decrease is apparent for the 1 and 2 dose groups.

DICK TESTING OF PERSONS WHO HAVE HAD SCARLET FEVER

Dick tests were done on individuals who had recovered from scarlet fever. Only cases were considered in which the diagnosis had been verified by one or the other of two health department contagious disease diagnosticians. Table III shows the results of the

TABLE III

Positive Dick Reactors After Recovery from Scarlet Fever

	Total	Positive	Negative	Per cent Positive
Dick tested during 1st year after recovery	225	29	196	12.9
Dick tested during 2nd year after recovery	478	76	402	15.9
Dick tested during 3rd year after recovery	212	40	172	18.9

testing when done within the 1st, 2nd, and 3rd years following recovery from the disease.

There are 3 per cent more positive reactors during the 2nd year after recovery than during the 1st year, and 3 per cent more during the 3rd year than during the 2nd year. This rise in percentage of positive reactors strongly suggests that some individuals who have acquired active immunity through an attack of the disease subsequently lose it.

The 12.9 per cent shown to be positive when tested within 1 year after recovery from scarlet fever suggests that either a large percentage of persons do not develop immunity from a single attack of the disease, or if the percentage developing immunity is nearly 100 per cent, then over 12 per cent lose their immunity in less than 1 year. Perkins,³ in returns from 1,016 cases collected from January, 1924, to April, 1927, reports 14 per cent positive Dick reactors in persons of all ages with a history of a past attack of scarlet fever, while returns from 735 cases Dick tested in the convalescent stage showed only 8 per cent positive Dick reactors.

In Milwaukee in 1934, 5,965 cases of scarlet fever were reported, and of these 68 developed scarlet fever again following recovery but before December 31, 1936. One case developed within 1 month after recovery and could therefore be classified as a recrudescence rather than a second at-

tack. In more than 75 per cent the diagnosis was verified in each attack by one of two health department diagnosticians. Within the first year after recovery, 37 second attacks occurred; within the second, 18 attacks; and within the third, 13 attacks.

If the percentages, shown in Table III to remain Dick positive after an attack of scarlet fever, indicate true susceptibility, it becomes possible to anticipate the number of persons who should have had second attacks within yearly intervals. The number of anticipated cases should approximate the number which actually developed each year. Table IV shows these calculations.

Comparison of the anticipated and actual numbers of cases during these yearly intervals shows the actual numbers equal, on an average, only 60 per cent of the anticipated number.

Ando, Kurauchi, and Nishimura⁴ have shown that the filtrate of the broth of hemolytic streptococcus cultures contains two substances capable of causing skin reactions. One is relatively heat labile and the other relatively heat stable. Their work, together with that of Toyoda and Futagi,^{5a} indicates that the thermolabile portion is exotoxin. They were able to prepare this in relatively pure form and concluded it is the true toxin of scarlet fever, contains no nitrogen, and never causes allergic reactions. On the contrary, they concluded that the thermo-stable portion is endotoxin, is

TABLE IV

Anticipated and Actual Number of Scarlet Fever Cases Among Those Who Had a Previous Attack of Scarlet Fever

	1st Year	2nd Year	3rd Year	Total
Number having had one attack of scarlet fever	5,965	5,924	5,903	
Per cent Dick positive after scarlet fever	12.9	15.9	18.9	
Number susceptible	769	942	1,116	
Per cent susceptibles attacked *	8.31	2.84	2.09	
Number anticipated cases	64	27	23	114
Number actual cases	37	18	13	68

* Refers to percentages of known Dick positives attacked within various 12 month periods taken from Table II.

identical with nucleoprotein obtained by extraction of the washed bacteria, is capable of acting as an allergen, and often produces allergic skin reactions in persons immunized against streptococci or scarlet fever.

Toyoda, Moriwaki, and Futagi^{5b} state that skin tests on children who previously had scarlet fever gave 32.7 per cent positives with their Dick toxin while with heat-labile exotoxin only 3.4 per cent were positive. The discrepancy in numbers of anticipated and actual cases of scarlet fever shown in Table IV can be explained on the basis of the 12.9 per cent reacting positively within 1 year after recovery. This figure is probably about 40 per cent too high and the error is probably due to positive tests on persons immune to scarlet fever but showing

allergic skin reactions to the nucleoprotein in the test material. The 3 per cent yearly increase in number of positive reactors is apparently reasonably accurate.

As shown in Table V, the percentage of cases having second attacks of scarlet fever only slightly exceeds the percentage of negative Dick reactors contracting scarlet fever, and also only slightly exceeds the percentage of positive Dick reactors who contracted the disease after receiving the standard 5 doses of toxin.

This, taken into consideration with the percentage of persons who show a falsely positive reaction as already mentioned, hardly seems to justify as a public health measure the Dick testing and immunization of persons giving a bona fide history of a previous attack

TABLE V

Scarlet Fever Among Dick Negatives, Artificially Immunized Dick Positives, and Those Who Have Had the Disease

	Total	Developing Scarlet Fever	Per cent Developing Scarlet Fever
Primary negative Dick tests in 1934--no immunization	5,142	48	0.93
Positive Dick in 1934 received 5 doses of toxin in 1934	3,731	33	0.88
Positive Dick in 1934 received 5 doses of toxin in 1934--negative re-Dick in 1934	3,292	28	0.85
Had scarlet fever in 1934	5,965	68	1.12

of scarlet fever. A pure or nearly pure exotoxin for testing would make such work less objectionable if it is undertaken.

VALUE OF DICK TEST IN CLINICAL PRACTICE

1. *The Primary Negative Dick Test*

In 1934 there were recorded 5,142 primary negative Dick reactors. As shown in Table V, of this number 48, or 0.93 per cent, developed scarlet fever before March 12, 1937.

The explanation may lie in faulty technic in giving the test or its interpretation. In Milwaukee every effort has been made to follow exactly the technic as outlined by the Dicks. If the human element of error entered, it is believed it would be introduced to at least an equal degree by others doing the same work under similar circumstances.

Does the reactive power of the skin vary at times in the same individual? Eddy and Mitchell⁶ have shown this to occur occasionally for scarlet fever toxin in measles and in the febrile stages of such diseases as pertussis, poliomyelitis, and varicella. This must play a negligible rôle in this series.

The work of Hooker and Follensby⁷ on "heterologous" toxins has demonstrated the existence of at least two thermo-labile hemolytic streptococcus toxins. This work deserves serious consideration as it may explain the occurrence of scarlet fever with rash in persons previously tested with the strong toxin A producing Dick ii strain but later infected with organisms such as the "Cook" strain which is a powerful toxin B but weak toxin A producer.

If, however, immunity as indicated by a negative Dick test can be lost when acquired actively and naturally by an attack of scarlet fever, or actively and artificially by toxin injections, why may it not be lost in a

small percentage of cases when acquired actively and naturally through a sub-clinical attack of the disease?

2. *The Negative re-Dick Test*

Table V shows that of 3,292 persons who had a negative re-Dick test after receiving the 5 standard doses of toxin 0.85 per cent developed scarlet fever within 3 years. Among the group of 3,731 persons who completed the 5 dose series, only 0.88 per cent contracted the disease, in spite of the fact that 199 were not retested, and of 240 showing a positive retest only 183 received a 6th injection. Moreover, of the 183 who received a 6th injection, 2 contracted scarlet fever for a case rate percentage of 1.09. One of these 2 had a negative re-Dick test after the 6th dose of toxin. Thus, the practical advantage of re-Dick testing has been negligible.

In this connection the work of Hooker and Follensby⁷ on "heterologous toxins" must again be considered. They estimate only some 2 or 3 per cent of young adults react positively to a mixture of toxins A and B, and negatively to toxin A alone. Contraction of scarlet fever with rash by a Dick negative person does not necessarily indicate a loss of previously sustained antitoxic immunity but may be due to infection with a strain of organisms producing a "heterologous toxin."

3. *The Primary Positive Dick Test*

I have repeatedly noticed that some individuals, especially adults, when returning for reading of a Dick test, show an intense reaction involving a large area and having a fairly dark red elevated center. Often a pale pink or dark red indurated area measuring over 1 cm. in diameter is noted. None of these reactions resembles the mild erythematous blush of the true reac-

tion. I have then repeated the Dick test at once, using the test material from another manufacturer. On reading this second test, it is often noted that the reactions are much smaller in size and some of the smaller ones have failed to appear at all.

Ando and Ozaki⁸ attribute such reactions to nucleoprotein in the Dick toxin and from the above results it would seem that the nucleoprotein content in various lots of Dick toxin is not constant. Ando, Kurauchi, and Nishimura⁴ state "the nucleoprotein solution is able to evoke skin reactions even in a high dilution (1:1,000-1:9,000 dilution)." Ando and Ozaki⁸ state "generally speaking the influence the N.P. in the filtrate has on the results of the Dick test is marked when a weak toxin is used in a lower dilution though also the N.P. content of a culture varies with the strain used. Accordingly, a high dilution of a potent toxin should be preferred for the Dick test, but the use of a purified toxin would be preferable."

Using purified toxin and culture filtrate, both standardized on young strongly positive reactors and applying both to persons ranging in age from 6 to 15 years, Ando and Ozaki⁸ showed that 31.2 per cent reacted positively to purified toxin and 33.2 per cent reacted positively to culture filtrate. They state "The difference in percentage of positives to both toxins is not so marked considered as a whole, but the difference is rather considerable when the percentage of positives in the higher age groups is considered."

That use of the standard Dick test control will not entirely avoid this difficulty is shown by Green⁹ who states "In the present instance abundant evidence has been forthcoming that an apparently identical reaction to crude filtrate in two susceptible individuals may mask considerable variation in their reaction to the separated exotoxin and endotoxin."

Accordingly, it seems that even among school children a small percentage of primary positive Dick reactors are immune to scarlet fever, and that the percentage of error increases with increase in age groups.

4. *The Positive Re-Dick Test*

When a re-Dick test is positive in an individual who has recently completed a standard 5 dose series of toxin, are we justified in assuming that the person is still susceptible to scarlet fever? As said, a small percentage were probably immune but allergic to the nucleoprotein before the injections were begun. As shown by Toyoda and Futagi^{5a} and Ando,¹⁰ the nucleoprotein fraction of the Dick toxin may act as an allergen in some persons so that while they are being immunized they will become allergic to thermo-stable endotoxin. These individuals are also immune to scarlet fever but show a positive re-Dick test.

In studying the results of re-Dick testing in school children in Milwaukee in 1934, it was found that in 12 schools only the test material of manufacturer A had been used and in 8 other schools only the material of manufacturer B.

TABLE VI

Re-Dick Testing of School Children with Test Material of Manufacturers A and B

	Laboratory A			Laboratory B		
	Total	Positive	Per cent Positive	Total	Positive	Per cent Positive
Children retested	1,610	68	4.2	1,153	100	8.7
Over 10 years old	453	28	6.2	321	32	10

Table VI shows the results of such re-Dick testing with products of these manufacturers.

Testing was done 2 weeks after completion of immunization. Only children who had received the standard 5 dose course were considered. Product A shows 4.2 per cent positives for all retested, and product B shows 8.7 per cent, while the average of the two is 6.1 per cent. This may account for the variation in percentage of negative re-Dicks reported by different authors. Children over 10 years of age showed 7.8 per cent positive re-Dick tests, a higher percentage than the 6.1 per cent shown by the entire group. The percentage was higher for these older children with each of the two manufacturer's products. Bacterial contamination of the material, with resulting skin infections, cannot be ascribed as the cause of this variation because only previously unused vials of test material were sent to these schools.

While the test material was undoubtedly accurately standardized for its true or thermo-labile exotoxin content the lots of various manufacturers vary as to their nitrogen-containing fraction or nucleoprotein. Veldee,¹¹ using commercial unconcentrated toxins from several laboratories, shows variation in total nitrogen content. Using his figures, the nitrogen toxin ratio as mg. of nitrogen per 100,000 S.T.D. is 8.93 for product of laboratory F and 6.23 for that of laboratory E, illustrating the variation that may occur.

CONCLUSIONS

1. During 3 years the case rate for scarlet fever was more than 14 times higher in unimmunized Dick positive reactors than in those who completed the standard 5 dose course of toxin.

2. During 3 years the immunity derived from 4 doses of toxin was as effective as that from 5 doses.

3. During 3 years the case rates for scarlet fever were lower in primary negative Dick reactors and positive reactors who completed the standard 5 dose course of toxin than for those who previously had an attack of scarlet fever.

4. During 3 years the practical value of re-Dick testing has proved negligible.

5. A culture filtrate free of, or as near as possible free of, endotoxin is desirable, at least for the purpose of skin testing.

REFERENCES

1. Zuger, Bernard. Group Infection and Immunity During a Scarlet Fever Epidemic in a Boys' School. *Am. J. Hyg.*, 21:588 (May), 1935.
2. Gordon, J. E., Badger, G. F., Darling, George B., and Schooten, Sarah S. Reaction of Familial Contacts to Scarlet Fever Infection. *A.J.P.H.*, 25:531 (May), 1935.
3. Perkins, R. G. Active Immunization in Scarlet Fever. *J.A.M.A.*, 89:1239 (Oct. 8), 1927.
4. Ando, K., Kurauchi, K., and Nishimura, H. Studies on the "Toxins" of Hemolytic Streptococci; III. On the Dual Nature of the Dick Toxin. *J. Immunol.*, 18:223 (Mar.), 1930.
5. Toyoda, T., Moriawaki, J., and Futagi, Y. *Experimental Researches on Etiology of Scarlet Fever with Criticisms from Standpoints of Epidemiology, Prophylaxis, and Therapy*, 1929. The Isolation Hospital of The Kwantung Government. Dairen, Manchuria.
 - a. Toyoda, T., and Futagi, Y. V. Defect of Dick Test and Its Remedy. p. 25.
 - b. Toyoda, T., Moriawaki, J., and Futagi, Y. IV. Does the Dick Reaction Tested With Streptococcus Toxin Indicate a Susceptibility to Scarlet Fever? p. 11.
6. Eddy, Bernice, and Mitchell, A. Graeme: Studies in Immunity; IV. The Effect of Diseases Other Than Scarlet Fever on the Dick Test. *Am. J. Dis. Child.*, 40:988 (Nov.), 1930.
7. Hooker, Sanford B., and Follensby, Edna M. Studies of Scarlet Fever; II. Different Toxins Produced by Hemolytic Streptococci of Scarlatinal Origin. *J. Immunol.*, 27:177 (Aug.), 1934.
8. Ando, K., and Ozaki, K. Studies on the "Toxins" of Hemolytic Streptococci; V. The Dick Test and Allergic Skin Reactions to Streptococcus Nucleoproteins. *J. Immunol.*, 18:267 (Apr.), 1930.
9. Green, C. A. Observations on the Toxic Fractions of Scarlatinal Streptococci. *J. Hyg.*, 35:93 (Mar.), 1935.
10. Ando, K. The Dick Test and Allergic Skin Reactions to Streptococcus Nucleoproteins. *J. Immunol.*, 17, Oct., 1929.
11. Veldee, M. V. Preparation of a Scarlet Fever Streptococcus Toxoid and Its Use in Active Immunization. *Pub. Health Rep.*, 48:549 (May 26), 1933.

National Health Conference - A Review

A NATIONAL Health Conference, called by the Interdepartmental Committee to Coördinate Health and Welfare Activities, was held in Washington, D. C., July 18 to 20. This committee was appointed by the President in August, 1935, following the passage of the Social Security Act, "in order that the full benefits of the various federal programs under the Act provisions might reach with minimum delay and maximum effectiveness the individual men, women, and children for whose aid and service the program was brought into existence." This committee consists of Josephine Roche, Chairman, former Assistant Secretary of the Treasury, in charge of the U. S. Public Health Service; Eugene L. Bishop, M.D., Executive Secretary; Arthur J. Altmeyer, Chairman of the Social Security Board; Milburn L. Wilson, Under Secretary of Agriculture; Oscar L. Chapman, Assistant Secretary of the Interior; and Charles V. McLaughlin, Assistant Secretary of Labor.

A Technical Committee on Medical Care has been working for some months under the Interdepartmental Committee. This committee consists of Martha M. Eliot, M.D., Children's Bureau; I. S. Falk, Ph.D., Social Security Board; and of Joseph W. Mountin, M.D., George St. John Perrott, and Clifford E. Waller, M.D., of the Public Health Service.

There were 171 persons invited to participate in the Conference by the Interdepartmental Committee. These persons were invited merely as indi-

viduals and for what they might contribute, rather than as representatives of particular groups. The Conference was carefully prearranged with respect to personnel, make-up, and agenda. The presence in large numbers of representatives of the consumers of medical care lent it interesting color and distinguished it from previous meetings of its kind. In addition to the persons formally invited to be present there were approximately an equal number of invited observers who were excluded from participation and discussion, together with members of the press. A classification of those who participated in the Conference may be summarized as follows:

Total number of delegates 171
 Delegates having a degree of M.D. 53
 Persons identified with
 Public health agencies 20
 Social and welfare agencies 20
 Labor 20
 Journalism 11
 Hospital management and organization 9
 Local, state, and federal government officials, exclusive of public health and hospitals 9
 Industry 9
 Agriculture 8
 Women's organizations 8
 Economists 4
 Educators 4
 Nursing 3
 American Legion 3
 Dentistry 3
 Foundations 2
 Miscellaneous organizations 10

Of the total, some 35 persons were identified with the American Public Health Association as Fellows or members.

This Conference, which was held at the suggestion of President Roosevelt

after considering the preliminary report of the Interdepartmental Committee presented to him in February, 1938, was opened by Miss Roche, as Chairman, who read a message from the President. The President enumerated some of the strides which have been taken by medical science and public health within recent years. He mentioned the extension of public health and maternal and child welfare services under the Social Security Act, the launching of a special campaign to control syphilis, the establishment of the National Cancer Institute, and the use of federal emergency funds for the expansion of hospital and sanitation facilities, the control of malaria, and many related purposes. The President pointed out that, in spite of these steps forward, there is need for a coordinated national program of action. Such a program, he said, must necessarily take into account the fact that millions of citizens lack the individual means to pay for adequate medical care. He stated that the economic loss due to sickness is a very serious matter, not only for many families with and without incomes but for the nation as a whole. He asked that the Conference plan a long-range comprehensive program providing for the most efficient cooperation of federal, state, and local government with voluntary agencies, professional groups, media of public information, and individual citizens.

At the outset, Miss Roche expressed the hope that the Conference might contribute to two ends: (1) a better understanding of national needs in the field of health and medical care; (2) the formulation of policies which will enable the medical and other professions, private organizations, federal, state, and local agencies, and individual citizens to cooperate in efforts to meet these ends.

Miss Roche went on to say that the

people of the United States are alert and determined that the frequently difficult but ultimately sure and progressive processes of democracy shall serve all the people and that human conservation is an obligation of government. She pointed out that the findings of the survey show that the gross sickness and mortality rates for the poor of our large cities are as high today as they were for the nation as a whole half a century ago. The average person in a relief family experiences 3 times as many days of disability annually as the average person in the upper income group. One in every 20 family heads in the relief population is unable to work because of chronic disability, as contrasted with only 1 in 250 heads of families with incomes of \$3,000 or over. Miss Roche pointed out that, when translated into human reality, the statistics show that 40 per cent of the counties in the United States where 18 million people have their homes have no registered general hospital, and that among 50 million Americans who live in families receiving less than \$1,000 income a year, illness and death increase their toll as income goes down, medical care decreasing sharply as need for medical care mounts.

There were addresses by Katherine Lenroot, Chief of the Children's Bureau, Department of Labor, and Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service. There followed a discussion of national health needs and the speakers included Dr. Irvin Abell, President of the American Medical Association; William Green, President of the American Federation of Labor; Dorothy J. Bellanca, Vice-President of the Amalgamated Clothing Workers of America; Mrs. H. W. Ahart, President of the Associated Women, American Farm Bureau Federation, and Dr. Hugh Cabot, Consulting Surgeon of the Mayo Clinic.

The Chairman inquired whether anyone was prepared to challenge the statement of need as made by the technical experts, and there was no response.

The second day of the Conference was utilized for the presentation by the technical experts of a general program of medical care, together with plans for insurance against loss of wages during sickness, a study of hospital facilities and studies of medical care for the medically needy.

In referring to the recommendations from the Technical Committee on Medical Care, Miss Roche pointed out that these recommendations were presented to President Roosevelt in February, 1938, and that it was at his suggestion that the National Health Conference was called. She stated that the Conference was not asked to take formal action on any part of these recommendations. They were put forward merely as a basis for discussion and the Interdepartmental Committee, she said, sought the frankest discussion of the means of improving the health services and medical care of the people of the United States.

THE NATIONAL HEALTH PROGRAM IN SUMMARY

The following represents a summary of the National Health Program as recommended by the Technical Committee on Medical Care to the Interdepartmental Committee to Coördinate Health and Welfare Activities;

A study of health and medical services in the United States indicates that deficiencies in the present health services fall into 4 broad categories:

1. Preventive health services for the nation as a whole are grossly insufficient.

2. Hospital and other institutional facilities are inadequate in many communities, especially in rural areas, and financial support for hospital care and for professional services in hospitals is both insufficient and precarious, especially for services to people who cannot pay the cost of the care they need.

3. One-third of the population, including persons with or without income, is receiving inadequate or no medical service.

4. An even larger fraction of the population suffers from economic burdens created by illness.

In its report the committee submitted a program of 5 recommendations for meeting with reasonable adequacy the existing deficiencies in the nation's health services. Although estimates of the total additional annual costs to federal, state, and local governments were submitted, the committee did not suggest that it is practicable to put into effect immediately the maximum recommendations. Rather it stated the broad problem and possible solutions and contemplated a gradual expansion along well planned lines with a view to achieving operation on a full scale within about 10 years.

Recommendation I—The expansion of public health and maternal and child health services.

The committee recommended the expansion of existing coöperative programs of the Social Security Act.

- a. The expansion of general public health services (Title VI). Prevention occupies the first place in this recommendation and increasing federal participation is proposed to promote a frontal attack on certain important causes of sickness and death for the control of which public health possesses effective weapons. In order to strengthen public health organization; to eradicate tuberculosis, venereal diseases, and malaria; to control the mortality from pneumonia and from cancer; and to promote mental and industrial hygiene; an estimate was made of \$200,000,000 annually for an adequate program with the proposal that approximately one-half of these increased funds be provided by the federal government.

- b. Medical and nursing care of mothers and their new-born infants, medical care of children, services for crippled children, consultation services of specialists, and more adequate provisions for the postgraduate training of professional personnel are included in this part of the recommended program. The objective sought is to make available to mothers and children of all income groups and in all parts of the United States

minimum medical services essential for the reduction of our needlessly high maternal mortality rates and death rates among infants, and for the prevention in childhood of diseases and conditions leading to serious disabilities in later years. A gradually expanding program reaching at least by the 10th year a total additional annual expenditure of \$165,000,000 was recommended. Again it was proposed that approximately one-half of the cost should be met by the federal government.

With reference to Recommendations II, III, and IV, the expansion of medical services and facilities, the committee explored the adequacy of services for the sick, the sickness experience of broad groups of the population, and the availability of professional and hospital services for these groups. The committee concluded that the needs for diagnostic and therapeutic services to individuals are greatly in excess of the facilities, even when supplemented by a strengthened program of preventive services as proposed in Recommendation I. The committee found that current practices in the provision of medical services and facilities fall far short of meeting these needs. It took account of personnel and facilities, of financial support of services required by persons who are themselves unable to pay for the care they need, of the sickness burdens of self supporting persons, of methods of paying for medical care, and of assuring income for workers who are disabled by sickness. It concluded that these needs warrant an expansion of medical services and facilities on a broader front than that contemplated in Recommendation I alone.

Recommendation II—The expansion of hospital facilities.

After making a special study of deficiencies in existing hospital and other institutional facilities, the committee was impressed by the increasing part which hospitals play in the health and sickness services. The committee found the hospital accommodations and or-

ganizations throughout the country ill adapted to the varying needs of people living under different social, economic, and geographical circumstances. In hospitals offering general care the percentage of beds supported by patients' fees is out of proportion to the ability of the population served to pay, and many general hospital beds are empty a large part of the time. There are too few low cost or free beds to satisfy the needs. There are wide areas—some 1,300 counties—having no registered general hospitals, and many others are served only by one or two small proprietary institutions. Only in large city hospitals have outpatient clinics been developed to any considerable extent. Governmental tuberculosis sanatoria and mental institutions tend to be overcrowded or are otherwise restricted in funds or personnel in rendering the community service for which they should be equipped.

The committee recommended a 10 year program providing for the expansion of the hospital facilities of the nation through the provision of 360,000 beds, including general, tuberculosis, and mental hospitals in rural and urban areas, and by the construction of 500 health and diagnostic centers in areas inaccessible to hospitals. These new hospitals or units would require financial assistance during the first 3 years of operation. Averaged over a 10 year period the total annual cost of such a program, including special 3 year grants for maintenance of new institutions, is estimated at \$146,050,000, of which construction would total \$110,650,000, and 3 year maintenance \$35,400,000.

Recommendation III—Medical care for the medically needy.

Grouped together under this recommendation is the need for persons without income and supported by general relief and, as well, families with small incomes. The committee pointed out that these persons are doubly handi-

capped. They have higher rates of sickness and disablement than prevail among groups with larger incomes. They have lesser capacities to buy and pay for the services they need. Current provision to assist these people is not equal to the need. The committee recommended that the federal government, through grants made to the states, should implement the provision of public medical care to two broad groups of the population. (1) Those for whom government has already accepted some responsibility through the public assistance provisions of the Social Security Act, through work relief programs, or through provisions of general relief and (2) those who though able to obtain food, shelter, and clothing from their own resources are unable to procure necessary medical care. In this way the test of indigency was removed from the requirements for relief. The committee estimated that, on the average, \$10 per person annually would be required to meet the minimum needs of these two groups for essential medical services, hospitalization, and emergency dentistry. This part of the program might be begun, it was suggested, with the expenditure of \$50,000,000 the first year, gradually expanded until it reached the estimated level of \$400,000,000 which would be needed to provide minimum care to medically needy groups. Again the committee recommended that one-half of the total annual cost be met by the federal government.

Recommendation IV—A general program of medical care.

Directing attention to the economic burdens for self-supporting persons created by sickness, the committee pointed out that there is need for measures which will enable such people to anticipate and to meet sickness costs on a budget basis. Summarizing their conclusions, as a result of many studies,

the committee stated that the costs of sickness are burdensome more because they fall unexpectedly and unevenly than because they are large in the aggregate for the nation, or on the average for the individual family. Except in those years when unemployment is widely prevalent, sickness is commonly the leading cause of social and economic insecurity. Without great increase in total national expenditures, the burdens of sickness costs can be greatly reduced, through appropriate devices to distribute these costs among groups of people and over periods of time.

In recommending the consideration of a comprehensive program designed to increase and improve medical services for the entire population, the committee pointed out that such a program would be directed toward closing the gaps in a health program of national scope left in the provisions of Recommendations I and III. To finance the program it was proposed that two sources of funds might be drawn upon: (a) general taxation or special tax assessments, and (b) specific insurance contributions from the potential beneficiaries of an insurance system. The committee recommended consideration of both methods, recognizing that they may be used separately or in combination.

Recommending that such a program should preserve a high degree of flexibility, in order to allow for individual initiative, and for geographical variations in economic conditions, medical facilities, and governmental organization, the committee indicated its belief that it should provide continuing and increased incentives to the development and maintenance of high standards of professional preparation and professional service. It was further pointed out that this plan should apportion cost and the timing of payment so as to reduce the burdens of me-

cost and to remove the economic barriers which now prevent the rendering of adequate care.

The committee made clear that in planning for a program of medical care of a magnitude to serve the entire population, this aim must be regarded as an objective to be fully attained only after some years of development. The rôle of the federal government, according to the committee, should be principally that of giving financial and technical aid to the states in their development of sound programs through procedures largely of their own choice.

Recommendation V — Insurance against the loss of wages during sickness.

The committee recognized the importance of assuring wage earners continuity of income through periods of disability. While a disability compensation program is not necessarily part of the medical care program, the cost of compensating for disability would be needlessly high if wage earners generally did not receive medical care necessary to return them to work as soon as possible. The committee believed that temporary disability insurance can be established along lines analogous to unemployment compensation and that permanent disability insurance may be developed through the system of old age insurance.

THE COST OF THE PROPOSED PROGRAM

Estimating the maximum annual cost to federal, state, and local governments of Recommendations I, II, and III, with duplications eliminated, the committee estimated that about \$850,000,000 of new funds would be required annually at the full level of operation, to be achieved within a 10 year period. This figure, however, was presented primarily as a gauge of need.

The committee pointed out that in proposing Recommendation IV for an adequate general program of medical

care, the maximum prospective annual cost would be in the vicinity of \$20 per person per year, or no more than is already being spent through the private purchase of medical care. However, in considering the possibility that a national health program more limited in scope than that which is outlined in the entire series might be adopted, it was believed that Recommendations I and II should be given special emphasis and priority. "Summarizing the entire report, the Technical Committee on Medical Care stated its conviction that, as progress is made toward the control of various diseases and conditions, as facilities and services commensurate with the high standards of American medical practice are made more generally available, the coming decade under a national health program will see a major reduction in needless loss of life and suffering and an increasing prospect for longer years of productive self supporting life in our population."

SUMMARIES OF THE CONFERENCE

In speaking over the radio during the Conference, Dr. Thomas Parran pointed out that the Conference was considering large scale measures to deal with the whole problem of health and medical care in the country at large. He emphasized the fact that not only the humanitarian basis of good health was considered but the savings to the nation which will accrue from a more healthful population. He added that the Conference differed in at least two important respects from similar conferences held in the past. In the first place it brought together not only the medical and other professional experts but representatives of labor, the farmers, and other groups of citizens who receive or would like to receive adequate health services and medical care. Dr. Parran quoted President Roosevelt as saying that, while the professional experts can help, nevertheless

the ways and means of dealing with this problem "must be determined with a view to the best interests of all our citizens." Secondly, he said, the National Health Conference is distinguished by the fact that it is intended to lead to action.

It was plain through Dr. Parran's address and many others that the people of the country realize that they are not obtaining the full benefits of modern medical knowledge with its tremendous scientific advances, and with even greater emphasis it was brought out that they are demanding more help and medical service.

Significant among the declarations of Dr. Parran were that, comprehensive and complicated as the whole program may seem, it is in no sense revolutionary. In each of its parts it seeks to do better, more skillfully, more universally for all the people, what is already done to conserve health in some communities or for some people. No radical change in medical practice is contemplated, according to Dr. Parran. He further pointed out that the first concern of the Conference is to reduce the amount of sickness rather than simply to spread the cost of sickness, and he pointed out that in this respect the American Medical Association and the representatives of all consumer groups were agreed. Also in agreement were many who felt that the underprivileged groups of our population who cannot provide good medical care for themselves need help from public funds if they are to have the benefit of medical science.

Charles W. Taussig, President of the American Molasses Co., summarized his own opinion which appeared to be widely shared at the Conference:

There seems to be a general acceptance at this Conference of the factual presentation of the desperate need for more adequate medical service to the underprivileged. Some opposition, however, has been voiced to a

federal subsidy to take up this slack. In other words, as a mass problem the need for a greatly augmented medical service is unanimously recognized, but some of us, unfortunately, hesitate to go beyond the mere recognition of the problem. A reason frequently given for this timidity is that a coordinated attack by the federal, state, and local governments on this problem of proper medical care will in some unexplained way destroy our democratic system of government. I recognize that what we have been discussing at this conference puts democracy to a severe test, for one of the first questions that we must ask of the democratic process is: Can it meet the recognized social requirements of our people?

The American concept of democracy has never carried with it the implication of a changeless political, social, and economic order; yet it has become the habit of a certain group to brand every suggested effort to improve the condition of the underprivileged and to make less cumbersome our governmental processes as being destructive to democracy. Totalitarians recognize such mass problems as we are considering here. They deal with them on a mass basis. But the genius of democracy lies in its ability to reduce the problem of the masses to its component parts of individual human needs and desires, and to solve the problem on that front.

We underestimate the virility of our democracy when we refuse to meet an acknowledged need, not because we do not know how to meet it, not because we lack the resources to meet it, but because we are afraid that some alien political philosophy may creep upon us unaware and destroy our institutions. If democracy in the United States has become such a feeble thing, it can no longer serve us. It is a paradox that the most vociferous vocal defenders of democracy join with Hitler and Mussolini in proclaiming democracy's alleged inability to cope with complex social and economic problems.

Let us remember that democracy is a sword as well as a shield, that its purpose is not only to defend old liberties, but to make new social and economic conquests as well. This Conference presents a magnificent challenge to the democratic process.

Adjourning after 3 days, the Conference adhered to the suggestion made by the Chairman and took no vote. It was announced that the government

Technical Committees would work over the material as presented and the criticisms made during the Conference with the objective of formulating legislative bills suitable for consideration by

the Congress, and it was suggested that a similar conference might be called within a few months to consider a definitive legislative program based on these recommendations.

CONFERENCE GLEANINGS

"Public health may well be the next great social issue in this country." Thomas Parran, M.D., Surgeon General, U. S. Public Health Service.

"We cannot attack a 10 billion dollar program with small change." Josephine Roche, Chairman, Interdepartmental Committee.

"Those of us who are concerned with the progress of medical science usually think that the great events of medicine occur only in the research laboratory or the operating room. We are witnessing here in Washington another kind of progress in medicine—an effort to put medical science to work. The National Health Conference may well be the greatest event in medical science which has happened in our time." Thomas Parran, M.D.

"The individual in need is indivisible as to his relief and his medical care." M. Antoinette Cannon, New York School of Social Work.

"This conference will mean further shifting of the center of gravity in this problem toward the consumer." Hugh Cabot, M.D., Rochester, Minn.

"It is indeed futile to increase the demand for better medical and health services without increasing the facilities." Charles W. Taussig, President, American Molasses Company.

"Our studies of the money value of a human life show that, taken as a whole, our human assets are at least five times as valuable as our economic assets." Louis J. Dublin, Ph.D., Metropolitan Life Insurance Company.

"Our purpose is not to create a Utopia but to face and accept at least minimum responsibilities for medical care." Fred Hochler, Director, American Public Welfare Association.

"The real question for us to face is what is the intelligent, decent, and adequate way to do this thing?" President Frank Graham, University of North Carolina.

"The consumer interest is with the medical profession now. It may not always be." John P. Koehler, M.D., Milwaukee, Wis.

"The prospect of having more people lean

for medical care on the broad shoulders of Uncle Sam has been distressing to a considerable number. I would rather have more people lean on the broad shoulders of Uncle Sam for this purpose than on the narrow and cadaverous shoulders of the Elizabethan poor laws. They were not a modern solution." Paul Kellogg, Editor, *Survey Associates*.

"There have been so many surveys of national health needs that, as one mother, I fear that our children will grow up to be unhealthy adults before we as a nation put into effect a sound and adequate health program." Mrs. J. K. Pettengill, President, National Congress of Parents and Teachers.

"Complacency now has no justification. The situation would seem to be too big for the resources of medicine to meet alone." Robert Osgood, M.D., Harvard University.

"In health protection self help is preferable to outside aid; government intervention in medicine is desirable as a last, not a first, resort." S. S. Goldwater, M.D., New York City Commissioner of Hospitals.

"If a wider application of the voluntary insurance principle will produce a readier flow of effective service, the principle is entitled to support." S. S. Goldwater, M.D.

"Medical care should be locally rather than nationally administered. The effective and economical administration of medical aid for the masses by huge federal agencies is well nigh impossible." S. S. Goldwater, M.D.

"Only a few years ago my people—the field workers, the packing house workers, etc.—did not know what it meant to demand that their needs, their lives, their happiness be considered. They were only half Americans with no voice in the government, with no part in planning this democracy. But now these men and women are organized and they have learned how to ask for what they want, how to demand what they need." Florence Greenberg, Chicago.

"I maintain that the first problem for this government is to relieve poverty and I maintain, as one who understands something of the nature of the practice of medicine, that medical care is not the most important

problem before the people of the United States today." Morris Fishbein, M.D., Editor, *Journal of the American Medical Association*.

"It is true that if the economists could show us how to produce and distribute an income equal for the health and other needs of every family, the need for many public health measures would be minimized. The interrelationship between poverty and disease is well known. Disease begets poverty and poverty in turn creates more disease. At the present time, however, our proven ability to prevent disease exceeds greatly our proven ability to control other causes of poverty. . . . Medicine and public health should lead economics rather than follow it. The application of preventive medicine offers the best opportunity to interrupt the downward spiral, to tear out the roots of poverty and the consequences of ignorance by attacking the one most readily preventable fact." Thomas Parran, M.D.

"I propose to recognize the needs which have been dramatized for us, to go home and to recommend to the American medical profession through the *Journal of the American Medical Association* and through the House of Delegates that they do all they can to meet these immediate and pressing needs without sacrificing the standards of medical care which will give the people good medical service." Morris Fishbein, M.D.

"My respect for the medical profession to which I belong is so great that I am sure that the quality of medical care which physicians provide will never depend on the method by which they are remunerated for their services." John P. Peters, M.D., Professor of Medicine, Yale University.

"If all of the groups of the country must help in solving this great problem of medical care, that means that the government will have to do it, does it not? And, really, the federal government is not an invading hostile power that knows nothing about the needs of this country. After all, what is it? It is ourselves, ourselves organized, and surely it is more or less susceptible to our influence." Alice Hamilton, M.D., Consultant, U. S. Department of Labor.

"You may rest assured that in any of the efforts which are made for the betterment of the health care of the people of this country you will have the wholehearted coöperation of the American medical profession." Irvin Abell, M.D., President, American Medical Association.

"The following is a typical case from the National Youth Administration: In a Middle-western industrial city, 1,800 boys and

girls were given a thorough physical examination. Forty-three per cent of them were found to be unemployable by private industry because of their physical conditions, but it was estimated that with corrective medical treatment this large portion of youth, who were occupationally handicapped because of physical defects, could be reduced to 8 or 10 per cent." Charles W. Taussig.

"If I may for a moment speak to you as the head of an industrial corporation, I should like to emphasize that the expenditure of \$850,000,000 for public health does not frighten business. Business bears a far greater financial burden now, due to our neglect of inadequate health control, than its share of the tax burden will be under the proposed plan. The annual toll of preventable illness measured in terms of money runs into billions. Progressive business will regard an adequate health service as a subsidy to industry—not as a burden." Charles W. Taussig.

"The participation of a labor representative at a conference of this kind to consider national health needs with a view to formulating a national program is in itself a significant departure and an indication of the growing recognition that the problem of health is no longer a private and purely professional concern, but that it is manifestly one of the widest possible public urgency." Dorothy J. Bellanca, Vice-President, Amalgamated Clothing Workers of America.

"In the large cities as well as in the rural areas the low income groups experience sickness and mortality today as if there had been no progress at all during these past fifty years. The results of medical science have reached those who could afford them." Dorothy J. Bellanca.

"There can be no acceptance by the medical profession of any system of medical care which is based on the idea that the well-to-do shall receive one quality of medical care while the farmer, the laborer, and the white collar worker are to be placated with a wider distribution of an inferior medical service." Irvin Abell, M.D.

"Spot maps developed by the Council on Medical Education and Hospitals of the American Medical Association reveal that only 13 counties in the United States are more than 30 miles distant from an acceptable general hospital, and in 8 of these counties there are less than 5 people per square mile of territory." Irvin Abell, M.D.

"According to the method proposed for testing the adequacy of distribution of hospitals in the United States, as presented by

the American Medical Association, one hospital of 10 beds in New York City and one in Chicago would be assumed to meet completely the needs of these communities. Measures of the actual utilization of hospitals are necessary. Otherwise the conclusions are absurd." Professor C.-E. A. Winslow, Yale University.

"The medical profession agrees with all other agencies on the importance of the following objectives: The provision of good medical care for all the people; the development of comprehensive preventive and public health services; the development of appropriate measures to combat specific health problems; and a continuous, orderly improvement of the distribution of medical services and hospital facilities, both by geographic and economic divisions." Irvin Abell, M.D.

"It is easy to say that there are many thousands or millions living in economic conditions where health and happiness are impossible in a democracy as vast as ours, but I would like you to realize that this problem varies not only from state to state; it varies so much in the different counties or townships in each state, that most formulas imposed on our people as a whole would do a great deal more harm than good. It is with this purpose in view, and as a result of the very able address delivered by Miss Josephine Roche at the meeting of the American Public Health Association last year, that the American Medical Association has inaugurated and is pushing to completion a painstaking study of the needs of medical care and the method for their provision in each county in the United States." Irvin Abell, M.D.

"I was interested to hear the president of the great American Medical Association refer to the survey which they are now carrying out. I do not myself feel much confidence in the result because I am not clear by precisely what method physicians are to know about people whom they never see. The people who get no medical care obviously do not crowd the doctors' offices and precisely how they are to arrive at figures which will be more convincing, if perchance we need any figures that are more convincing, is beyond the limits of my slow mind." Hugh Cabot, M.D.

"The day is not so very long gone when the medical profession of not only this but every other country took the general and very barren view that all medical problems were their problems and that the whole problem of sickness and preventive medicine was the problem of the physician. There

has been accumulating evidence that the consumer is beginning to wake up to the fact that he has a collateral interest in this problem, that he is the one who is paying the bill, and that he has a right to a very large word in what is done and in how it is done. Here in this Conference for the first time I hear clearly and boldly and bravely and gallantly stated the problem of the medical consumer." Hugh Cabot, M.D.

"It is my firm belief that this Conference marks the ridge of the hill between the old indifference to health as a matter of national concern and a new understanding that health is the first and most appropriate object for national action." Thomas Parran, M.D.

"I think we shall have action on several aspects of our problem because it would appear that at the present time people in general are beginning to take it for granted that an equal opportunity for health is a basic American right. They are thinking just a little ahead of the law makers and even, I fear, ahead of the practitioners of public health and of clinical medicine." Thomas Parran, M.D.

"The social significance of this Conference lies in the fact that for the first time we can be optimistic that action will follow plans." Thomas Parran, M.D.

"The ideal traffic plan is not that which provides a first-aid station at all intersections and streamlined ambulances to carry away the victims of traffic accidents." Thomas Parran, M.D.

"I see in the discussions of this Conference an extraordinarily touching appeal to the medical profession. It has been the boast of the medical profession, and the just boast, and the source of proper pride, that if a woman came with a sick child to an individual physician and said, 'My child is suffering and we want you to care for it,' that he never failed to respond. Now what has happened here this week is that the representatives of millions of men and women in the United States have come to the medical profession as a group and said, 'Our members are sick and suffering and we want medical care for them, and we want means provided by which we can pay.' Is it possible, is it conceivable that that appeal is going to be rejected? I think not." C.-E. A. Winslow, Dr.P.H.

Pending final action by the House of Delegates, "The Association may well abide by the fundamental principles and policies already established. . . .

These principles and policies do not forbid, nor do they seem to contemplate any opposition to, a well considered expanded program of medical services, particularly preventive medical service, when the need can be established. Neither is there any fundamental principle or policy which in any manner opposes aid to the indigent or even to what are called the medically indigent if their medical indigence can be estab-

lished, provided such aid comes through agencies which will not tend to lower the quality or standards of medical care." Editorial comment on the National Health Conference, from the *Journal of the American Medical Association*.

REGINALD M. ATWATER, M.D., DR.P.H.
Executive Secretary
American Public Health Association

Visual Education—The Oberlaender Trust

VISUAL education in the field of public health has a great future in the United States. There are people in every community who would like to see such work established on a permanent basis, and undoubtedly much progress will be made within the next few years. The Trustees of The Oberlaender Trust have felt that a distinct contribution could be made to this movement by making the experience of the German pioneers available to public health officials in America.

As a first step in this direction, and with the definite objectives of helping to make the general public better acquainted with fundamental questions of health, and of stimulating interest in the founding of health museums in various parts of the United States, the Trust has purchased two large collections of models from the Deutsches Hygiene Museum in Dresden. The first, containing more than seventy separate exhibits, has been placed temporarily in the New York Museum of Science and Industry. The other, a set of thirteen models, has been donated to the Museum of Science and Industry in Chicago. All are duplicates of material in the Dresden Hygiene Museum.

The collection in New York, which is

shown under the title "The Exhibit of Man," features a Transparent Man and Miss Anatomy, other models ranging from a blood cell enlarged a thousand times to a figure showing the circulation of the blood through the heart and important blood vessels. Requests have been received for permission to copy the wooden torso showing longitudinal sections of the body and the wooden figures showing the number of calories required by workers in various occupations. Such requests are granted when the duplicates are to be used for educational purposes.

The whole collection from the New York Museum of Science and Industry will be transferred to the World's Fair next year. In the meantime plans are being worked out for a future program to utilize the material in the interests of health education. Dr. Bruno Gebhard of Germany, a consultant on health education who has had much to do with the development of the Dresden Hygiene Museum, is now in America on the invitation of The Oberlaender Trust and the American Public Health Association. He is serving as an adviser to these two organizations and to the Committee on Medicine and Public Health of the New York World's Fair, in connection with health exhibits.

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

September, 1938

Number 9

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

THE NEW FEDERAL LAWS RELATING TO FOODS, DRUGS, AND COSMETICS

AFTER five years of consideration,¹ the Congress of the United States has finally adopted two important new laws to amend and strengthen the more or less obsolescent Federal Food and Drug Act of 1906. One of these measures, giving the Federal Trade Commission jurisdiction over false advertising of foods, drugs, devices, and cosmetics, was signed by the President on March 21, 1938, to become effective 60 days from that date; the other measure, a new Federal Food, Drug, and Cosmetic Act, was signed on June 25, 1938, and becomes effective one year from that date, except that several sections, including one (Sec. 701) authorizing the Secretary of Agriculture to hold hearings and promulgate regulations for the enforcement of the act became effective on the date of approval of the law. The Secretary is also authorized to designate prior to the effective date food having common or usual names and exempt such food from the requirement of the act, but only for a reasonable time to permit the formulation, promulgation, and effective application of definitions and standards of identity.

Under the terms of the first law mentioned, which is officially designated as Public—No. 447—75th Congress, and is popularly known as the Wheeler-Lea Act, the jurisdiction of the Federal Trade Commission is extended to the advertising of all foods, drugs, diagnostic and therapeutic devices, and cosmetics (except soap) in interstate and foreign commerce, or through the mails. Whenever the Commission believes that any person, partnership, or corporation is engaged in, or is about to engage in, the dissemination of false advertising, defined as "an advertisement, other than labeling, which is misleading in a material respect," the Commission may bring suit in a federal district court to enjoin the dissemination of the advertisement. If the commodity advertised is injurious to health because of its use in accordance with its advertising, or the advertising is intended to defraud or mislead, the advertiser may be haled to court and prosecuted criminally without previous notice. Ordinarily, however, false advertising is regarded as an unfair or deceptive trade practice, with the advertiser subject to a proceeding by the Commission consisting of notice, a hearing, and, if the findings justify it, the issuance of a cease and desist order, which may

be appealed to a federal circuit court of appeals, and finally to the Supreme Court.

In determining whether an advertisement is false, the law states that there shall be taken into account (among other things) not only representations made or suggested by statement, word, design, device, sound, or any combination thereof, but also the extent to which the advertisement fails to reveal material facts. Advertisements of drugs are not deemed false when disseminated only to the medical profession, provided they disclose the formula and contain no false representation of material facts. Publishers, radio-broadcast licensees, and advertising agencies will not be liable for the false advertising of manufacturers and sellers if they furnish to the Commission on request the name and address of the person responsible for the advertisement.

This somewhat drastic law, if reasonably enforced, should have a salutary effect upon the nature of food, drug, device, and cosmetic advertising in interstate commerce, although it seems likely that the law will give rise to much time consuming litigation. It is also unfortunate that there should have been the division of authority between the Federal Trade Commission and the U. S. Department of Agriculture, which has had and continues to have jurisdiction over the labeling and the adulteration of these same products. Not only is this department equipped by training and experience to carry out the necessary administrative duties, but it has adequate laboratory and technical facilities for the purpose.²

Under the terms of the new Federal Food, Drug, and Cosmetic Act (Public—No. 717—75th Congress), the adulteration or misbranding of any food, drug, diagnostic or therapeutic device, or cosmetic (except soap) in interstate commerce is prohibited. This act not only gives administrative jurisdiction to the Secretary of Agriculture over devices and cosmetics, which were not included in the law of 1906, but it also provides for injunction proceedings in federal district courts to enjoin adulteration and misbranding of foods, drugs, devices, and cosmetic, as well as providing for the customary criminal actions for violations, and for seizures and destruction by court action of dangerous and fraudulent commodities. In order to carry out the purposes of the act, the Secretary of Agriculture is authorized to promulgate necessary regulations.

Since the law is a lengthy one, and it is difficult to review all of its many specific provisions within the limited space of an editorial, it is suggested that health officials and other interested sanitarians secure copies of the act from the U. S. Department of Agriculture, for careful study.

In general, however, it may be stated that the new law contains comprehensive and somewhat broadened definitions of adulteration and misbranding of the various products, so as to include in the former category not only the presence of poisonous or deleterious substances that are injurious to health, but the absence of valuable constituents, the substitution of inferior materials, and, in the case of drugs, substandard quality, purity, or strength. Under misbranding is included not only false and misleading labels, but improper imitations of labels of other products, misleading containers, and in cases of foods for special dietary uses, failure to give information as to vitamin, mineral, and other dietary properties. Special labels are required on drugs containing habit-forming narcotics, with adequate directions for use and suitable warnings on such labels. In the section on cosmetics there is a provision that coal-tar hair dyes must be labelled with a

caution against their use for dyeing eyebrows and eyelashes, and the statement that such use may cause blindness.

An important section of the law requires that new drugs can be introduced in interstate commerce only after filing an application, with submission of evidence and data, and the securing of a permit from the Secretary. Refusal by the Secretary of such a permit may be appealed to the federal courts. If this provision of the law had been in effect a year ago, the series of unfortunate deaths from the use of an elixir of sulfanilamide probably would not have occurred.

The new law does not cover meat and meat food products, which are still subject to the Meat Inspection Act of 1907, as amended. It also keeps in effect various other existing laws, such as the Butter Standards Act of 1923, the Filled Cheese Act of 1896, the Filled Milk Act of 1923, and the Import Milk Act of 1927.

The Federal Food, Drug, and Cosmetic Act of 1938, as sponsored by the late Senator Royal S. Copeland, represents a noteworthy advance over its 32 year old precursor, the Federal Food and Drug Act of 1906, as occasionally but inadequately amended. The enforcement of this law after June 25, 1939, should do much to aid in the protection and promotion of public health in this country.

REFERENCES

1. Editorial. The Copeland Bill. *A.J.P.H.*, 25:961 (Aug.), 1935.
Editorial. Federal Legislation to Control Foods, Drugs, and Cosmetics. The Copeland Bill. *A.J.P.H.*, 27:381 (Apr.), 1937.
2. Editorial. Wheeler-Lea Bill Giving Federal Trade Commission Jurisdiction Over Foods, Drugs, Devices and Cosmetics Becomes a Law. *J.A.M.A.*, 110:1112 (Apr. 2), 1938.

THE AIRPLANE AND YELLOW FEVER

THE rapid multiplication of airplanes of all types and the tremendous increase in their use for personal transportation has necessarily been a matter of great concern to all nations. A number of reports have been made and efforts are under way to bring about international agreements and methods for inspection of passengers and for disinsectization of the planes. The increase in the use of planes is shown to some extent by a report¹ of the examinations made at Khartoum: 287 in 1935; 667 in 1936; and 364 up to July 2, 1937. Indeed Khartoum is now a modern city and the crossroads for airships coming from many different directions. Its airport is the stopping place for night for all of the great lanes. Apparently this gives an abundance of time for disinsectization and inspection, which requires a longer or shorter time, according to the arrangements of the interior and the number of insects which it is necessary to capture. At least one-half hour is required for inspection. The work of the Custom officers and of the Postal service should be delayed until the planes have been cleared of insects. It is interesting to note that in the Sudan until 1936 the insecticides employed were "Flit" and "Shelltox," widely used in this country, but since then a cheaper mixture made on the spot is used, which has the added advantage of being practically noninflammable.*

Mosquitoes are found chiefly in the compartments occupied by passengers, but also in the baggage compartments, especially in those planes in which these are reached by a separate door at the side. So far no mosquitoes have been

* Extract of pyrethrum..... 5.8 per cent
Essence of citronella..... 2 per cent

Tetrachloride of carbon..... 49 per cent
Kerosene 43.2 per cent

found in the new hydroplanes which have been put in service since April, 1937. For over 3 years, only 3.5 per cent of planes examined at Khartoum have harbored mosquitoes. Of these, 79 per cent are those coming from the East. The great majority of mosquitoes found so far have been *Culex* and only 10 *Anopheles*.

An elaborate report² covers the sanitary conditions of airplane navigation in the French Colonies and Mandates. So far everything has gone remarkably well, in spite of the fact that the international agreement of April, 1933, has not been ratified by France and consequently not promulgated in her Colonies. Most of the airports of the French Colonies are in regions where yellow fever has been known or is quiescent, and in which there should be provisions to protect against the disease. It is pointed out that there are considerable areas of dispersion of yellow fever virus in South America and in Africa, and great possibilities of spread if there is introduction of carriers or the insect vector by airplanes.

Vaccination against yellow fever seems to be the ideal, but so far it is inapplicable to those populations living in these areas. It is held that in order to give complete security it should be carried out in laboratories, be controlled frequently, and revaccination done where the tests show insufficient protection. Such conditions are not applicable to masses.

One has only to look over the various airplane routes as summarized by Inspector Sorel to realize the possibilities of spread of disease by planes. The French use four great lanes in common with several other countries in reaching their colonies and mandates. Joining these great highways are sidelines, practically all of which connect with areas in which yellow fever might exist.

America³ is not at all free from some of the dangers due to rapid travel by airplanes. Our Public Health Service is represented in the International Office of Public Hygiene, and has always been awake to the situation. At Miami, steps have been taken to guard against the importation of the *Aedes aegypti*, and researches are being made on better methods for disinfection of airplanes. A special corps is being instructed to study the *Aedes aegypti* in the cities of the South, and it is held that no airport of entry should be established within 20 miles of a city which shows a high index for *Aedes*.

In August, 1937, a living *Anopheles maculipennis* was found in a Chinese Clipper arriving at Honolulu from Alameda, Calif. Hence, instructions have been given to the Pan-American Airways and to the Medical Officer of the Quarantine Station at San Francisco that a complete fumigation be done at departure by an operative of the Service.

The constant travel of passengers from the United States to South America and back again, which can take place within a week, shows the necessity of the greatest care in our contacts with those of our neighbors on the South within whose borders yellow fever is found.

The greatest menace in the world today, and perhaps the one which is being thought of most, is the possible infection of India by yellow fever. The climate is suitable and apparently all it needs is the introduction of the virus. There we have several hundred million people who have never been exposed to yellow fever, who exist on a low plane of living, and who, as far as we can judge, would be very susceptible to the disease, yet planes of the Imperial Airways have flown from the Sudan to India in less than 48 hours.

We have been forced to abandon the "simple man-*Aedes aegypti*-man epi-

demiology," though it still yields perfect results in many areas. The virus of yellow fever has been transmitted in the laboratory by several species of mosquitoes found in Africa and South America other than the *Aedes aegypti*, and, in 1935, we were shocked by the discovery of "Jungle Yellow Fever," perhaps the natural and more permanent form of the disease.⁴

Aedes from both Egypt and India have been found susceptible to laboratory infection. Opportunities for the introduction of yellow fever into India certainly exist, and are multiplying constantly.

This imperfect sketch founded on an elaborate report by experts must demonstrate to everyone the necessity of international coöperation in the establishment of airports, their freedom from mosquitoes known to carry disease, the regulations concerning passengers, the disinfection of airplanes, etc. All of this applies with double force to airports of entry.

REFERENCES

1. Richards, Dr. H. *Off. Internat. d'Hyg. Publique*, Mar., 1938, p. 563.
2. Sorel, General Medical Inspector. *Ibid.*, p. 538.
3. Cumming, Surgeon General Hugh S. *Ibid.*, p. 536.
4. Soper, Fred L. The Newer Epidemiology of Yellow Fever. *A.J.P.H.*, Jan., 1937, p. 1.

NEW LIGHT ON OLD BELIEFS

THE announcement of the discovery of the tubercle bacillus in 1882 was followed immediately by experimental studies of various sorts, notable among which were those of two of the great scientists of the veterinary profession.¹ Nocard in France and Bernard Bang in Copenhagen, reported respectively at the first Congress on Tuberculosis in 1888, and the Congress of Hygiene, 1891. Both were concerned with the possible danger of the transmission of tuberculosis to human beings by eating the flesh of tuberculous cattle.

Nocard injected large quantities of tubercle bacillus into the veins of cattle. Within a few hours, the blood was absolutely free from the germs which had been introduced. In a few days, the many organisms which had been caught in the muscles had been destroyed or, as he said, at least put in such a condition as to be of no danger—they had lost their power of multiplication as well as their virulence. Bang drew blood from twenty cows with advanced tuberculosis and after defibrination, injected it into the peritoneal cavities of 38 rabbits and 2 guinea pigs in doses of from 10 to 18 c.c. Only two of the inoculated animals showed positive results and the cow whose blood had proved virulent was affected by an acute miliary tuberculosis following an injection of tuberculin.

Without discussing further the many experiments which have been done, it may be said that as early as 1883 experiments had shown that in the immense majority of cases, the danger of infection was confined entirely to the tuberculous lesions and that the blood and the juice from the muscles in particular only exceptionally carried tubercle bacilli.

It has, of course, been recognized for many years that in probably every case of tuberculosis in cattle which went on to death, there are moments when through the disruption of a tubercle, germs are thrown directly into the blood, but, as in the experiments quoted above, the blood rapidly gets rid of the germs which have been thrown into it.

This has been the teaching for many years and the results have proved the practical correctness of the experimental findings.

Recently (1936) studies have been brought forward which must lead to some revision of our views. Nieberle² has investigated the pathogenesis of those forms of cattle tuberculosis in which there is fresh, dry, infiltrating caseation, a good example of which is what he calls "mastitis caseosa." In these cases, the udder shows large areas of caseation surrounded by an area of hyperemia and an infiltration extending widely. Sections show tubercle bacilli in large numbers at the periphery and they enter the damaged blood vessels readily. A tuberculous "bacillemia" is demonstrable under the microscope, corresponding to that which has been mentioned as occurring in advanced cases. Similar changes occur in the lymph nodes and, like the lesions in the udder, may liberate enormous numbers of the bacilli into the general circulation. In 13 such cases, tubercle bacilli were found in the meat. The author calls attention to the fact that just such changes occur in rapidly caseating lobular pneumonia in cattle. In 18 of 21 such cases, examination of the meat showed the presence of tubercle bacilli, and similar results have been obtained in caseating tuberculosis of the adrenals, kidneys, uterus, ovaries and serous membranes.

In summary, tubercle bacilli were found in the meat in 69 of 82 cases. Both cultural and animal inoculation were positive in 26 cases, animal inoculation alone in 39, and cultural examination alone in 4. In every case, the bovine type of organism was found.

In discussing the importance of these findings, Nieberle says that there are 2 main types of tuberculosis in which occur what he calls "fresh blood infection": (a) miliary tuberculosis in children; (b) acute miliary tuberculosis in adults. In children, generalization occurs from a primary focus which is often easily found, while in adults, it is seldom demonstrated. Both of these types are, however, found in cattle, and in 15 of 23 cases, representative of both of these types, tubercle bacilli were found in the meat by bacteriological examination. When the generalization occurs late in the disease, the lymph nodes are not often involved. When it occurs early, they invariably show tuberculous changes.

Nieberle insists that in examination of meat for tuberculosis, the qualitative character of the tuberculous lesions should be more carefully studied, and he considers this point more important than the quantitative distribution. For example, a small area of dry caseation with marginal hyperemia is more important from the health standpoint than widely distributed lesions of a productive nature, owing to the fact that the former is able to give rise to what he has termed the "fresh blood infection." He holds that the whole idea that tuberculosis of the related lymph nodes indicated tuberculosis of the muscles and of the bone-marrow is incorrect, and the latter can arise only from hematogenous infection and indicates a tuberculous "bacillemia."

However, the greatest protection for the human race lies in proper cooking. Only where such meat is eaten under-done or raw as in tartar sandwiches does danger exist. No doubt more careful inspection along the lines indicated will be of advantage, but even accepting the new findings, as we do, we doubt if the danger to human health is extremely acute. We again emphasize, however, the great protection of proper cooking.

REFERENCES

1. Nocard, Ed. *Les Tuberculoses Animal.*
2. Nieberle, K. *Pathologische Anatomie und Pathogenese der Tuberculose und ihre Bedeutung für die Fleischhygiene. Dtsch. tierärztl. Wschr.* (Abstract in *Vet. Bull.*, June, 1938.)

SAMUEL M. CRESWELL

WORD has just been received of the untimely death of one of Tacoma's finest and most useful citizens and one of the most promising young physicians in the field of public health administration. Dr. Creswell, who has served as Health Officer for Tacoma with a remarkable record of accomplishment which has attracted national attention, was killed in an automobile accident just outside of Seattle. This tragedy is a new bit of evidence of the peril which stalks our crowded highways. A truck made a sudden turn across the highway and into it plunged the vehicle in which Dr. Creswell was a passenger.

American public health loses a promising pupil. A fatality is a deep tragedy to the household and in this case should stir to action the thinking minds in public health and health education who too complacently observe the ever increasing death rate due to automobile accidents. Forty thousand lives in a single year snuffed out by this preventable cause. In 1937 typhoid fever in 93 American cities with a population of 38,885,435, claimed but 318 victims. In the same year in these cities there were but 568 deaths from diphtheria. How insignificant are these figures when compared with death on the highway.

While it is not suggested that health officers become highway patrolmen, it is incumbent upon public health administrators to assume a leading rôle in the conservation of human life, whatever be the immediate cause of death. Recognition of the numerical importance of deaths from accidents is evidenced by the inclusion of this item in the schedule of the annual health conservation contests. May we suggest Dr. Creswell's untimely death as a circumstance about which to construct a program of public education.

In 1933 Tacoma was awarded a free survey by the American Public Health Association. At that time this city ranked twenty-third in its health rating among American cities. It will ever be a credit to Dr. Creswell's memory that within a few years Tacoma appeared among the cities of honorable mention, and in 1937 was awarded first place for its syphilis program—first on the list among all the American cities to enter this, the first, of the syphilis contests.

To Mrs. Creswell and her two daughters the American Public Health Association extends its heartfelt sympathy. To the public health profession may we express the hope that Dr. Creswell may not have died in vain. Human sacrifice to the whims of the careless driver should be eliminated.

PUBLIC HEALTH EDUCATION*

Again in October—Health education will have its full share of time and attention in the 1938 Annual Meeting of the A.P.H.A. in Kansas City.

There will be regular sessions, luncheons, and a dinner meeting.

There will be an extensive headquarters with a fine new line of health educational materials, and the opportunities for individual and group consultation.

There will be the ever recurring and frequently valuable lobby sessions.

There will be a bigger and better display of scientific exhibits.

There will be an hour by hour showing of motion pictures.

Because of the abundant space, we welcome at headquarters demonstrations and displays not possible in New York.

Now is the time to start planning that you may be more sure of getting to Kansas City.

"Fairy Tales and Neuroses"—Under this heading *Health News* of New York State Dept. of Health (March 7, 1938) discusses a *London Times* editorial on the supposed unsuitability of many fairy tales for the child audience. It all grew out of objections to the "horror" scenes in "Snow White and the Seven Dwarfs."

Our contribution to the discussion is a report on the fears of a 5 year old boy and a 7 year old girl. A friend had taken the children to see "Snow White." After reporting on the picture

to their mother, a slight, somewhat tiny person, she expressed a desire to see the picture. "But Mother, you must not go. You would be scared. You are too small."

A State Helps the Locals—The New Jersey Tuberculosis League, 15 E. Kinney St., Newark, accompanies the weekly issue of its *News* with ready made press material prepared for easy localization.

At the present time this takes the form of "Story of the Week," the reproduction of a recent local news story, with blank spaces in which local facts or statistics may be filled in by any other county organization.

A recent story titled, "N. J. Clinics File Report," based on clippings received from Ocean and Cumberland Counties. Here is the copy as sent out on a single mimeographed letter size sheet:

New patients attending tuberculosis clinics in the state during 1937 totaled 19,657, according to an annual report released recently by the New Jersey Tuberculosis League and forwarded to the (organization). County had new cases. The statistics are compiled with the cooperation of the State Department of Institutions and Agencies and the New Jersey Department of Health.

Of those attending clinics last year in County per cent were diagnosed as having tuberculosis, per cent were non-tuberculous, and per cent were listed for observation. The last group included childhood type tuberculosis, contact cases among children and adults, and children who would not immediately be diagnosed and who are kept as active clinic cases because of physical or clinical signs.

The death rate from tuberculosis last year was 48.1 per 100,000 for the state.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

..... County's rate was There were deaths from tuberculosis in County during 1937, of whom were Negroes. New cases of tuberculosis reported to the State Health Department were of which number were reported from (organization) chest clinics. According to the report school children were tuberculin tested in the schools of County, were positive.

..... holds its last clinic for the summer season (date). Attending a chest clinic does not mean that any individual necessarily has tuberculosis; on the contrary it is one of the best ways of finding the person does not have it.

When Addressing Mail—If you wish to reach a particular individual in any organization it is the safer plan to note his title or his name *above the name of the organization*.

If you wish to label a letter as "personal" or "confidential," or to request that it be forwarded or not forwarded, it is by far the safer plan to *make the notation above the remainder of the address*.

In many cases if such special instructions are written in the lower left corner they are overlooked in the handling of quantities of incoming mail.

Grammar for Writers—May Lamberton Becker, "The Reader's Guide" of *New York Herald Tribune Books* (every Sunday), is wise and widely informed on the choice of books. A correspondent

... asks for books on English grammar and composition that will answer almost any question that may come up in preparing copy for the printer.

Here is Mrs. Becker's reply:

This inquirer already owns *A Manual of Style* (University of Chicago Press), the *New Handbook of Composition*, by Edwin C. Woolley (Heath), a useful book of reference in correcting technical errors; and the *Advanced English Grammar* of G. L. Kittridge and Frank E. Farley (Ginn); for dictionaries he has *Webster's New International* (Merriam) and the *Shorter Oxford English*

Dictionary, two volumes (Oxford University Press). Make a note of these; they are well worth putting into a permanent reference library of this sort, and indeed form one by themselves.

For additions to this I suggest as a beginning a new book expressly for people who are inexperienced in sending stuff to the printer and will find this practical for that purpose: *Manuscript and Proof*, by John Benbow (Oxford University Press). I know printers who swear by the *Authors' and Printers' Dictionary* (Oxford) of F. H. Collins, a little book to help proofreaders and others, with a full list of abbreviations. Another brief book with much in it, just out, is H. A. Treble's *A B C of English Usage* (Oxford). Even smaller than this is the *Author's Book* Macmillan issues for 50 cents: this is packed with sound information, one of the elementary kind needed by most people beginning to send out manuscripts. I don't see how the list of dictionaries this inquirer already has could be bettered, but such a library is not complete without the provocative *Modern English Usage* of H. W. Fowler (Oxford). Its immediate effect is to put one into the state of the centipede who debated which foot came first; Fowler makes a mistake seem so awful that you stop writing for fear you may make one. As you rapidly come back on the rebound, ready to fight the King's English single minded, the result is all to the good.

Why Not More about National Agency Publications? — We agree heartily that more about the aids and publications offered by national agencies should be given in these pages. We realize that only a limited audience actually learns of new publications, posters, slides, and other materials issued by the nationals. It is economically impossible for the nationals to mail announcements to all who might be concerned.

Moreover, even to reach those most directly interested, more than a single approach is needed. Long and careful observation shows that many important service announcements are lost after delivery by mail. In all too many state and local agencies distribution or circulation of service information among staff members is inadequate. And fre-

quently the printed or mimeographed statements are so small or inconspicuous in appearance that they are neglected.

Furthermore, various staff members of state or local agencies have an interest in health educational materials even though their primary job is in another technical field. Among the staff members of agencies, nationals in all health fields, state and locals, are the people who answer letters, who meet people in their offices or in field visits, who are asked about health education. Neither health workers nor lay readers are discriminating when looking for information. Whoever they happen to write to, or whoever they are accustomed to address for information or advice on other specialties are likely to be asked about health education materials. For example, even the New York correspondents of local banks are sometimes requested to get information for use in Keokuk or Kakamazoo.

Then outside there is a vast unnumbered audience of people who want to help in one way or another, or who might help. Among these are people who write for periodicals, students in schools and colleges, leaders in all the varied non-health groups which do something in health education. They go to libraries, they may call on local health workers, they write to women's magazines and to various people in the larger cities.

These paragraphs lead to two suggestions. The first is that health workers generally keep in reasonable touch with the whole field of health, the health education programs for the various special fields, and the sources and nature of available health education materials. The more we all help to play the other fellow's game, the stronger all will be.

The second suggestion is that the national agencies and other national

sources of health education materials help this department to make a continuing and fairly complete record of all new material. The *Journal* is to be found in so many public, college, and school libraries, and of course in the offices of state and local health agencies. With full coöperation in recording new materials we have at least one fairly permanent source of information available at one or a number of places in every sizable community.

It seems to be up to the nationals to make this service all that it might be.

A periodic checking of mailing lists is important. Not to cut out waste addresses, but to insure the inclusion of useful addresses. Our experience is that such addresses do get lost from mailing lists.

Many Pictures—Some Words—
See 88 story telling pictures, accompanied by a "sound track" of 88 pages, each with a line of text or several lines, as may be needed. In *Land of the Free*, by Archibald MacLeish. Harcourt, Brace and Co., New York, N. Y.

A poet weaves pictures and words into a tapestry picturing thoughts and lives of many people.

STATE TB. BULLETINS

Michigan's *Health*, with a fairly "modern" layout of its 2 outside pages, gives the last page to an "editorial" (with no capital letters).

New Jersey's *N.J.T.L. News*, in its weekly one legal cap page (printed stock heading) carries news from the counties and announcements of plans and helps, usually in paragraphs less than 6 lines long.

The most intimate of all the trusted house organs is *Flashes*, a mimeographed issue of the New York State Health Committee on Tuberculosis which enters the hands of the organization in the way of

hunches for the every day jobs of city and county workers.

Ohio Public Health gives most of its first cover page to a well displayed quotation. One from Osler in June, 1938.

Wisconsin's *Crusader* "Questions and Answers" column prompts a query as to why this feature is not more common.

MAGAZINE ARTICLES

See "Why 'Magazine Articles'?" on another page to learn some of the reasons for publishing this partial list of articles on health topics.

"To my unborn Son," by T. Sucrue. *American Magazine*, 250 Park Ave., New York, N. Y. Jan., 1938. 25 cents. A letter from a father picturing contrasts between childhood conditions of the father from those of the expected son, as to health and otherwise. An interesting device.

"Becoming a Mother Is Too Often a Needless Rendezvous With Death," by Hazel Corbin; picture of a father's clinic class; "Mobilization for New York's Battle Against Syphilis," by Dr. Thoe. Rosenthal; "Account Payable on Presentation," by Jacob Goldberg (venereal disease costs). *Better Times*, 44 E. 23d St., New York, N. Y. June 6, 1938. 35 cents. Many illus.

"Japan Invades China With Drugs," by M. Lester. *Christian Century*, 440 S. Dearborn St., Chicago, Ill. May 11, 1938. 15 cents. How the drug traffic is being fostered!

"Feet First," by H. Lees. *Collier's*. June 25, 1938. Care of the feet.

"Key to Lockjaw," by J. D. Ratcliff. *Collier's*. July 9, 1938. Services made possible by the "biological-laboratory" horses; how serum is produced and distributed.

"Looking You in the Eye," by H. Lees. *Collier's*. June 11, 1938. How the eye works; what may go wrong. "Fascinating gadget, the eye."

"Make Safety Pay," by D. Lindley.

Collier's. March 26, 1938. "You can't scare people into taking care of themselves on the highway. Why not try offering a reward?" Rochester's answer is described.

"That Child's a Problem," by L. McCorky. *Collier's*. May 21, 1938. "But he needn't be." Here is the answer.

"Death to Food Fallacies." *Consumers' Guide*, Dept. of Agriculture, Washington, D. C. Nov. 29, 1937. "Here are a few false, foolish, or half-true ideas about nutrition to unload from your pack of prejudices."

"The Healing Knife," by George Sava. *Cosmopolitan*, 57th and 8th Ave., New York, N. Y. July, 1938. 25 cents. Autobiography of an anonymous surgeon.

"Mellon Institute Is Scientific Cradle of Industrial Discoveries: Its scientists now turn to fight widespread and dreaded silicosis." 2 pages. *Life*, 330 E. 22d St., Chicago, Ill. May 9, 1938. 10 cents.

"A motorist's nightmare," depicted by Rockwell Kent (1 page); "The Traffic Problem: Its Best Solution Lies in Foolproof Highways" (1 page); "After 100 Years American Roads Are Only Half as Fast as the Cars Traveling on Them" (2 page picture diagram); "Traffic" (2 pages showing types of accidents and the people who cause them); 6 pages of safer streets and highways. *Life*. July 4, 1938.

"From Stout to Slim." *Look*, Des Moines, Ia. May 24, 1938. 10 cents. 2 pages of famed reducers: Hutton, Talley, Whiteman, etc.

"If You Take It Easy, You Can Enjoy Life after 50: A Health Guide for the Middle-Aged," by Dr. Morris Fishbein. 2 pages of pictures good to be made up into an illustrated folder. *Look*. June 21, 1938. Also "What Are Your Chances for a Happy Marriage?" Includes:

"6. Are You Preparing Yourself for Mar-

riage (or have you already done so) by reading carefully at least two good books on marriage? (Three points.)"

"By discussing marriage problems with your family doctor or some well informed persons other than your parents? (Two.)"

"Doing nothing to inform yourself about marriage? (One point.)"

These two pages suggest a new form of presentation quite unlike typical, sometimes stodgy, health advice printed matter.

"Young Britain Learns the Perils of Auto Traffic" (a page of teaching devices); "Your Feet . . . Things You Should Know about Them" (2 pages); "The Folly of Fireworks" (2 pages); "Bernarr Macfadden: Building Bodies Built His Millions" (2 pages); "What Happens when You Sit in a Draft" (1 page); "How to Stay as Slender as You Are" (2 pages). *Look*. July 5, 1938.

"Science Helps the Police Detect Drunken Drivers" (2 pages); "Plastic Surgery" (3 pages). *Look*. Aug. 16, 1938.

"They're Not Playing Today" (children injured by automobiles); "They Breathe Their Medicine" (new facilities for medication by nose and throat). *Look*. Aug. 2, 1938.

"Medicine's Misalliance," by James Rorty. *Nation*, 20 Vesey St., New York, N. Y. June 11, 1938. 15 cents. Reviews various manifestations of "medical care" turmoil in and out of A.M.A.

"The Health of the People: What Social Workers Should Do about It," by John A. Kingsbury. *Social Work Today*, 6 E. 46th St., New York, N. Y. June, 1938. 15 cents.

"My Back Is Killing Me," by Maxine Davis. *Pictorial Review*, 57th and 8th Ave., New York, N. Y. July, 1938. 10 cents. "Backaches—what brings them on, how to prevent them, what to do when we have them." Also "Hypersensitive or Allergic Children," by Drs. Fishbein.

"The Miracle of the Iron Lung," by

T. Mahoney. *Rotarian*, 35 E. Wacker Drive, Chicago, Ill. July, 1938. 25 cents.

"Little Doc," by Frazier Hunt. *Saturday Evening Post*. April 23, May 7, May 14, May 21, May 28, 1938. The life story of Dr. Dafoe.

"Yellow Jack Breaks Jail," by Victor G. Heiser, M.D. *Saturday Evening Post*. May 21, 1938. Yellow fever, from early New Orleans, today, and in the future.

"I Saw a Resurrection," by M. Kienast. *Saturday Evening Post*, July 2, 1938.

Why "Magazine Articles"?—Why give space for lists of articles on health topics to be found in current general and special magazines? Because we have an idea that the material will be useful both inside and outside the health department or association.

"What do you think of that article in such and such magazine?" is a question put to many health workers. The lists help to anticipate that question. A group of staff members might report on different articles. Notes as to errors or good qualities of the articles could be attached to copies placed in reference files or in the public loose leaf collection.

What *Collier's* or *Saturday Evening Post*, *Life*, or *Look* says to many people has a significance all of its own. So that it seems worth publicizing such articles in several ways: listing on the bulletin board . . . noting in the house organ . . . distributing mimeographed lists to the staff . . . making lists available to any who may ask for them . . . supplying lists to teachers, many of whom will be glad to learn of especially good articles, and will wish to know what articles can be trusted . . . bringing to the attention of staff members articles which contain good talking points on subjects which enter into the current program of the organization.

Other uses of the listed material include reprinting of some articles for health agencies, or by them. More reprinting of articles and picture pages might be done to advantage.

The magazine material carries suggestions for health education. The topics or the titles may help. The types of pictures, and ways they are used may suggest how some of our own material can be put up to look less like health "education." (Remember what many people think of "educational" motion pictures, and "educational" radio programs.)

STATE DEPARTMENT BULLETINS

Arizona Public Health News carries this statement on its front page:

"The Welfare of the People is the Supreme Law."

Connecticut Health Bulletin (June, 1938) listed "reference books of value to persons doing laboratory work on water and sewage samples," and

"Current scientific journals which contain more up-to-the-minute information of value to persons making laboratory examinations than do text books or reference books."

Connecticut Health Bulletin once a year carries one leaf, scored for easy tearing out, which says:

"If you wish your name to be retained on the mailing list for the Monthly Health Bulletin please sign on reverse side, tear off this page, return at once." (We wonder how many of these sheets are returned?)

Florida Health News carries on its

back page a silhouette map of the state with this message:

Watch This Map: it denotes the progress of County Health work in Florida. Each white dot stands for a full-time county unit."

Indiana's *Monthly Bulletin* runs cartoons, with a dozen or fewer words of conversation, headed "Uncle Doc."

"New Activities of the Massachusetts Dept. of Public Health" is the theme of the Jan.-Mar., 1938, issue of *The Commonwealth*, Massachusetts Dept. of Public Health. The 86 pages include the Division of Adult Hygiene, Postgraduate Extension Courses, Training of Lay Readers, New Materials in Health Education, etc.

A weekly feature of *New York State Health News* is a shrewd, folksy monologue headed "'Dr. Jones' Says—."

Ohio Health News makes good use of carefully selected quotations in addition to good original matter. Ohio may attempt to crowd too much good copy into the 4 weekly pages. The small type makes it look a bit heavy to the reader.

Oregon's *Weekly Bulletin* and North Carolina's *Health Bulletin* are among the state bulletins which publish book reviews. A good idea for wider use?

The *Wisconsin State Board of Health Bulletin* frequently reprints health editorials from newspapers and other periodicals. Under "With the Wisconsin Editors" more space is given to such material than in any other state house organ.

BOOKS AND REPORTS

Occupational Disease Symposium—*Chicago: Northwestern University Medical School*, 1938. Planograph copy, 86 pp., paper cover.

This symposium was held September 27–28, 1937, in Chicago, and followed recognition by Northwestern University of the increasing prominence which industrial disease has come to occupy in the field of general medicine. The university established its department in this field in 1936. Full facilities were placed at its disposal, with arrangements for presenting findings to the medical officers of interested industries.

Exhibits were shown by the Chicago Municipal Tuberculosis Sanatorium as well as a shadow-box display of nearly 60 chest roentgenograms by Dr. Hollis Potter. Dean Irving S. Cutter acted as general chairman. The papers presented concerned: "The Rôle of Allergy in Industry," by Dr. Samuel M. Feinberg; "The Rôle of Allergy in Industrial Dermatoses," by Dr. Marion B. Sulzberger; "The Healthy Chest and the Modifying Influences of Silicosis and Silicosis with Infection," by Dr. Eugene P. Pendergrass; "Some Phases of the Pathology of Silicosis," by Dr. Leroy U. Gardner; "Industrial Solvent Exposures and Their Control," by Warren A. Cook; "Some Recent Developments in the Field of Industrial Solvents," by Dr. Alice Hamilton; and "Industrial Lead Poisoning," by Dr. Robert A. Kehoe.

The banquet session provided Introductory Remarks by Dean Cutter, a paper on "The Prevention of Occupational Disease," by B. C. Heacock, and a closing paper on "The Future of

Industrial Medicine," by Dr. Morris Fishbein.

The titles of the papers, and the prominence of the names of the authors give ample evidence of their importance and authoritative sources. Many interesting points are contained in the discussions. Several of the papers are followed by bibliographies. The proceedings of this symposium form one of the most recent comprehensive collections, and should be of interest to physicians and industrial establishments as well as to hygienists in general.

EMERY R. HAYHURST

Life and a Living—*By Committee for the Care of the Jewish Tuberculous, Inc. New York: Altro Work Shops, Inc.*, 1937. 65 pp. Price, \$.35, paper, \$.50, cloth.

With a preface by Dr. Kendall Emerson and a concluding address by Louis I. Dublin, Ph.D., on the occasion of the 21st anniversary of the Altro Work Shops, Part I is devoted to the "Cure" of Tuberculosis, and Part II, to Industrial Convalescence. There are a number of photographs and charts.

The basic concept of the Altro Work Shops is that medical care of the tuberculous can be effective and enduring only when it combines social work at the sanatorium, care of the family in the home, and intensive care after discharge, which must, of course, include a rehabilitation program. It is essentially an industrial rehabilitation program. Instead of the age-old advice, "find some light outdoor job" (which jobs are practically nonexistent), the plan has been to place

the worker in the Altro Shops under close medical supervision which permits activity correlated with safety to the worker and his surroundings. The plan is in some respects similar to the Papworth Village Settlement, Cambridge, England, which has been so ably promoted by Sir Pendrill Varrier-Jones for a number of years.

The Altro Shops have served 10,000 patients and their families in the 23 years to 1936. This report reviews the organization of the original committee, the clinics, the difficult adjustments necessary, and the plan of financing. A city garment work-shop in place of industrial farm colonies was decided upon. Patients came from many occupations but were trained by expert garment makers. The shops turned out more than 500,000 shirts at contract rates for the U. S. Navy during the war. The output is sold on value and not on sentiment. At present, hospital orders represent about 69 per cent of the business, hotels and restaurants 18 per cent, industry and others 13 per cent. High piece-rates are paid.

A two story brick building with a sun roof, especially designed for the purpose, accommodates 135 patients. It contains many labor-saving devices and represents a total investment in land and building of about \$190,000; in equipment and stock of \$83,000; and clear assets of \$81,000. Will Irwin once remarked that Altro was the only place he knew that used a time-clock to keep people from working. All patients are expected to stay at the shop the full day and not to work elsewhere. Vacations are granted and everything possible is done to restore the tuberculous to health. Many return to their former trades. While some must remain for years, others are "cured" in a few months' time. One chart shows that, of earlier patients, 41 per cent were well and working 10 to 20 years after discharge; another, 80 per cent

after 6 months to 10 years. Many originally had positive sputums. During 21½ years patients earned in wages an aggregate of \$1,472,000. Many other interesting data are given. As Dublin says in his address, "The results speak for themselves."

EMERY R. HAYHURST

Teaching for Health—By *Marguerite M. Hussey, Ph.D.* New York: New York University Bookstore, 1938. 312 pp. Price, \$2.75.

This book considers primarily the conduct of the program of public education in such a way as to provide healthful experiences for the child and the application of the principles of general education to instruction in the field of health.

Following a discussion of the historical approach in the development of health education methods, and definitions of health, health education, and health objectives, one finds such titles as: Leadership Organization of the Activities Program for Health, Studying Out-of-School Life, Studying School Life, Studying the Individual, Home-School Coöperation, Technical Teaching, and Printed Materials. There is a brief chapter on the measurement of results and one on units in teaching for health.

The book contains an extensive argument for putting junior and senior high school health teaching in the hands of the teacher of physical education together with a very brief consideration of the other possibilities. The author warns against too extensive injection of health content into tool subjects and dangers which exist in using dramatization, modelling, drawing, and other activities to motivate health practices. She emphasizes the importance of basing health instruction upon the immediate health needs of the pupil, but says little about the relationship of health education to the essential public health

needs of the community. The author considers methods at all levels of education, but there is, perhaps, somewhat more emphasis upon the secondary than upon the elementary or college level.

The book is interestingly written, particularly those phases which have to do with the healthful conduct of general education and the needs of the individual child. Perhaps the reader may differ slightly with some of the generalizations such as: "Good health enables the octogenarian to get as much zest out of life as the adolescent," "All this means that the school must be responsible for the health education of the home as well as of the learner . . ." "The person with varied interests is the happy person, the contented person," . . . "Ideally, there should be a bowel movement after every meal . . ." These disagreements will not be serious, however, and the book is interesting and useful.

C. E. TURNER

Disease and the Man—By Roger F. Lapham, A.B., M.D. New York: Oxford University Press, 1937. 143 pp. Price, \$2.00.

The author views with alarm the apparently persistent swing of the physician's pendulum toward science at the cost of leaving the patient as a human being too much out of the dual equation. In the good old days the family physician had very few scientific crutches on which to hobble along toward the cure of disease, but he was compelled to know a great deal about his patient. In present-day practice of medicine the physician is under such constant strain to keep up with the advances of his profession scientifically that he is prone to neglect the human beings who constitute his clientele as such.

The book is an attempt to get the pendulum to swing back in reasonable measure toward the patient. The wise

physician, and by implication, the one who more than makes both ends meet, has the happy faculty of steering satisfactorily between the entities disease and patient. Six of the 12 chapters of the book elucidate technics on how the physician may capture, hold, and direct the patient while curing the disease.

This is a book primarily useful to medical students, teachers in medical schools, to physicians who may feel themselves a bit weak in blending human relations with science in medicine. It sticks to the subject of how to better private practice. It has not a single paragraph on the burning questions of the hour, "state medicine," "socialized medicine," "medical trade unions," etc.

W. W. PETER

Modern Ways With Babies—By Elizabeth B. Hurlock, Ph.D. Philadelphia: Lippincott, 1937. 347 pp. Price, \$2.50.

The first three years of life are included within the scope of this readable and comprehensive book. Its purpose is said to be "to bridge the gap between the scientific investigator and the parent." In this it succeeds quite well.

All books on the care of babies of necessity deal with about the same subjects, though with varying emphasis. This one, as might be expected from the fact that the author is a psychologist, is at its best in the chapters having to do with the baby's problems in acquiring good habits and emotional control. The need of incentive and opportunity is stressed wisely and more fully than is usually done. Especially interesting chapters are devoted to babyhood emotions, intellectual growth, becoming socialized, and discipline. The book ends with a discussion of personality.

There is a good list of suggested readings and an apparently adequate index.

On the whole, this is an excellent

common sense aid to the intelligent mother, sufficiently detailed and resourceful without any irritating dogmatism. MERRILL E. CHAMPION

Atlas of Skeletal Maturation (Hand)—By T. Wingate Todd and Associates (1926–1936). St. Louis: Mosby, 1937. 202 pp. Price, \$7.50.

In opening this interesting volume the reviewer is impressed immediately with its quality as to selection of paper, type, arrangement of material, and excellent illustrations. It is easy to see even upon casual examination that an enormous amount of work has gone into the production of this volume. Dr. Todd gives due credit to a host of colleagues and assistants who have collaborated with him over the past 10 years in making this study possible.

The skeletal maturation of the hand is illustrated by a large number of roentgenographic plates set up as "standards." Each plate is thoroughly documented with explanatory notes, and references are given to basic material. The whole presentation is highly technical and must be interpreted in terms of the standards and technics laid down in the introductory chapter on maturation. One is struck with the magnitude of the undertaking and the difficulties inherent in the interpretation of such a large mass of data with so many variables.

The book is the outcome of studies which have been frankly experimental from the beginning. The selection of the group of children, the working out of technics, the statistical handling of material, and the final establishing of standards for comparison are unique.

It should be noted that the investigators have submitted themselves to a great deal of self criticism in the attempt to harmonize subjective and objective data. Standards have been arrived at by considerable sifting of material. The anatomical descriptions

may be accepted as they stand as the work of a competent anatomist. Where Todd and his collaborators have challenged the traditional viewpoint on growth, development, and maturation is in the interpretation of their roentgenographic records as "standards" of maturation in relation to health fluctuations of the individual. It is to be desired that others equipped to carry on similar investigations will adopt tentatively the standards laid down in this atlas to determine if other series of measurements confirm the conclusions reached by the author of this intriguing volume.

Abt in his *System of Pediatrics* has pointed out that Thomas Morgan Rotch as early as 1907–1910 called attention to the value of the roentgen rays in delineating the "small bones of the wrist as a basis for an anatomical index of growth in relation to the 'somatic' as opposed to the 'chronological' age of the child." Todd and his collaborators have carried this forward in differentiating growth and maturation and in indicating the factors which enter into the maturation process, thus affording a basis upon which better standards may be erected. RICHARD A. BOLT

Mental Hygiene for Nurses—By Elizabeth Lee Vincent, Ph.D. Philadelphia: Saunders, 1938. 263 pp. Price, \$2.00.

The increasing emphasis on mental hygiene and the appreciation of the value of mental hygiene principles have been calling for the publication of just such a book as this and that it should have been done so readably and so authoritatively in non-technical language should make it a "must" book for every nursing library and for every nurse.

It would be difficult to select one chapter or section for special commendation as the same high standard is maintained throughout.

As indicated by the chapter headings a large part of the book is applicable to all young people, whether student nurses or students in any other educational course as well as to young people whose student days may have ended. Being addressed particularly to nurses, however, it is unlikely to be read by many other student groups much as it is desired to place such a book as this in the hands of all students in our educational institutions.

The value of the book is enhanced by the questions for study and discussion at the end of each chapter, most of which require the student to consider her own problems, attitudes, and reactions.

A carefully selected bibliography suitable for nurses and students generally is appended to each chapter and a complete index is also provided. A thoroughly excellent and exceedingly useful book. G. H. STEVENSON

Les Epidemies et l'Histoire—By Albert Colnat. Paris: Editions Hippocrate, 7, rue des Grands-Degres, 1937. 191 pp. Price, \$1.35.

The author begins with a few well considered remarks on the influence that microorganisms of disease have had on history. Especially have epidemics left their mark. The suddenness, extent, and violence, with the sense of helplessness which they evoke in a stricken community, lead to the most extravagant and unreasonable actions. Even today there are those who regard them as the vengeance of an offended God.

The great epidemics of the past are reviewed in order, beginning with those which afflicted the Jews and are told of in the Bible; next those of the Roman Empire are considered, and, after that, those of the Middle Ages. In this section particularly we have a good description of the rat and its dangers, also the Hundred Year War, with its

direful effects. The fourth section deals with modern times. The author describes the discovery of America and the pandemic of syphilis. He credits to the Spanish historians the idea that the disease was carried to Europe by the sailors of Columbus who had contracted it in Haiti. The fifth section considers the wars in which Napoleon took part, and introduces to us Baron Larrey. The last section brings us to the present day and considers the epidemics of the World War.

The author calls attention to the fact that this struggle brought into practice many of the best discoveries in military hygiene. The confidence of the soldier in the Medical Department grew greatly. On the one hand he was sustained in battle by his patriotism and his confidence in the precision of modern arms; on the other, by the thought of the provisions for his comfort and treatment behind the lines.

While we know that such great epidemics as have marked wars in the past are no longer possible, their rôle in history has not come to an end, but we can confidently hope that the day is not far when all of the known diseases will have disappeared from the earth.

The book is well written and, as far as we are able to judge, authentic. It is abundantly and excellently illustrated. While it does not reveal any historical facts which were unknown, it is none the less an excellent presentation.

MAZÛCK P. RAVENEL

Public Works Engineers' Year-book, 1938—Including the Proceedings of the 1937 Public Works Congress held at Atlanta, Ga., Oct. 4-6, 1937—Published by the American Public Works Association, 850 E. 58th Street, Chicago, Ill., 1938. 459 pp.

In addition to the more detailed discussion of selected problems of current interest to public works officials, this report contains a review and appraisal

of events and developments in all phases of public works engineering. Of interest to sanitary and public health engineers are the articles concerning water works practice, sewage treatment, and refuse collection and disposal.

In water works practice there was observed an increased use of pretreatment to reduce filter loads, the use of coarser sand sizes, more universal adoption of filter surface washing, the construction of all-steel tank filter plants, expedients for reducing condensation in filter plants, and various appurtenances designed to assist operators and promote better handling of plants. During the year two large cities built and operated water treatment plants for industrial water supplies.

More sewage treatment plants using the activated sludge process were built than were the settling tank-trickling filter type of plant. The Imhoff tank plant also appears to be supplanted by plain sedimentation tanks and separate sludge digestion. Improvements were noted in treatment plant mechanization, utilization of sewage sludge gas, and the training of treatment plant operators by state health boards.

Refuse collection and disposal was marked by improved collection vehicles with covered bodies and low loading heights. Incineration of garbage and rubbish is gradually supplanting inadequate dumping areas.

In conjunction with these subjects, descriptions are given of the Birmingham (Ala.) industrial water supply and the Atlanta (Ga.) sewage disposal system and refuse incinerator.

F. J. MAIER

Pneumonia and Serum Therapy—
By Frederick T. Lord, M.D., and Roderick Heffron, M.D. New York: Commonwealth Fund, 1938. 148 pp. Price, \$1.00.

This handbook appeared first in 1936

under the sponsorship of the Commonwealth Fund. This revised edition makes its appearance 2 years later, contains important new information concerning dosage and results of serum therapy for the various types of pneumonia, and discusses the use of the newly developed antipneumococcus rabbit serum. The authors, both of whom have been active in the Massachusetts Study of Pneumonia Control, are eminently qualified to write on the subject.

Especially interesting is the chapter on serum reactions and methods of prevention. The authors take the position, now rather generally accepted, that attempts to desensitize allergic patients is of uncertain value and should not be too heavily relied upon.

Lord and Heffron recommend that antipneumococcus serum be always given in divided doses. There is now a tendency in some clinics to give serum in one dose, but in the opinion of the reviewer, while this may be good practice in experienced hands, the recommendation for divided dosage is a safer procedure for the general practitioner.

The authors report 1,043 cases of Type I pneumonia treated with serum during the first 4 days of the disease with a death rate of only 13.9 per cent. It is interesting in this connection to note that Rogers has recently reported 1,023 cases of Type I pneumonia treated with serum within the first 4 days for which the fatality rate was identical—13.9 per cent.

This volume, containing as it does the last word on the serum therapy of pneumonia, should prove invaluable to both practitioners and public health officers.

RUSSELL L. CECIL

Introduction to Physiological Chemistry—
By Meyer Bodansky, M.D., Ph.D. (4th ed.). New York: John Wiley, 1938. 686 pp. Price, \$4.00.

With three highly successful editions to his credit, Dr. Bodansky's readers have come to expect from him a superior work, and he has not disappointed them in this latest edition.

Although an introduction to the subject, it is something more. Starting from the crossroads of chemistry, biology, and medicine, it penetrates a considerable way into one of science's enchanted lands. Thorough in its treatment of the subject matter, it is complete in all essentials. There is a judicious blending of the historical with the current. It includes all the new alignments and developments in this ever progressing science. It mentions the latest achievements in the isolation of virus proteins, the fundamental physical-chemical concepts in physiological oxidations, the objective tests of nutritional status, the newer approach to intermediary metabolism through substitutive insertion of deuterium, the heavy isotope of hydrogen into fats for purposes of identification. These are biochemical topics of the day. It is singularly free from errors, although one may be noted: "hemarolopia" is a misspelling for hemeralopia, and even this latter term is misapplied as a synonym of night blindness, nyctalopia being the preferred term.

To bring such a comprehensive body of material within the limits of 686 pages has involved careful and judicious selection. Even that would not be sufficient if it were not subjected to admirable condensation. Its style and arrangement help it to achieve brevity.

Not the least of the book's strong points is its full bibliography, particularly with references to monographs or reviews on many topics. This should continue to be helpful to students confronting the subject for the first time.

This new edition gives every indication that, as a textbook, it will continue to hold the esteem of students.

To those with a scientific leaning or training who have never gratified their suppressed urge to know how chemistry has helped to remake biology and medicine, or to those who may have lost and wish to renew their touch with developments in this field, this book has much in it that is keyed to their range.

H. D. KRUSE

"Marihuana"—The New Dangerous Drug—*By Frederick T. Merrill. Washington: Opium Research Committee, Foreign Policy Association, 1200 National Press Building, 1938. 48 pp. Price, \$.15 (special rates for quantity orders).*

The Foreign Policy Association has prepared a pamphlet on marihuana, which should be useful to health officers since it contains besides essential information, good illustrations of the plant in growth, its leaves, the seeds, and the dried flowering top which gives the largest yield of resin.

By the end of 1938 the majority of states had some prohibitory marihuana legislation. The Marihuana Tax Act of 1937, which is an internal revenue measure, nevertheless only helps to restrict the trade of marihuana to legitimate purposes.

This pamphlet will assist the health officer in the preparation of informative articles for the layman and enable him to cooperate intelligently with state and federal authorities in protecting his community against abuse of the use of this dangerous drug. J. ROSSLYN EARP

Physicians' Vitamin Reference Book—*By the Medical Division, Professional Service Department, E. R. Squibb and Sons. New York: E. R. Squibb & Sons, 1938. 126 pp.*

This book is an advertisement which is worth while and deserves notice. It has been well prepared by the Medical Division of the Professional Service Department of E. R. Squibb and Sons.

It is free from the ordinary blurb.

The description of each vitamin is preceded by a summary of estimated daily requirements, and stated in the International Units where these are available. The vitamin content of a number of foods is given. The Council on Pharmacy and Chemistry of the A.M.A. is frequently referred to. The entire book is well documented, and as far as we have been able to judge, is authoritative. We believe that as far as this part of the book goes it is entirely reliable and will be a useful guide to physicians, for whom it is written.

The book ends with a list of Squibb vitamin products, which is straight advertising. Many of these products violate the principles laid down by the Council on Pharmacy and Chemistry and the Council on Foods of the A.M.A., in that they smack of polypharmacy. Interestingly enough, a "New Series of Articles on Vitamins" has been prepared, the first of which appeared in the *J.A.M.A.*, February 19, 1938, p. 577. This says:

In a previous survey of progress in this field it was found necessary to warn the public and the medical profession against the commercial exploitation of individual vitamin preparations and particularly against the promotion of mixtures of vitamins as panaceas. The Council on Pharmacy and Chemistry is still convinced that for the present there seems to be no more logical basis for including a variety of vitamins in one preparation than there is for combining a number of other well known dietary essentials in a single pharmaceutical product.

The only exceptions to this are vitamins A and D, which occur together in nature.

No price is given for the book and we understand that it will be sent to any physician who writes to the firm for it. MAZÛCK P. RAVENEL

The Nursery Years—By Susan Isaacs. New York: Vanguard. Rep. 1936. 138 pp. Price, \$1.50.

The simplicity and frankness with which Susan Isaacs writes makes reading of *The Nursery Years* delightful. It is refreshing in that one does not have to wade through technical terminology, but in a few simply written, readable pages can get at some searching truths about child care and training.

The book was written originally for parents concerning their relationships with their children, but all adults can profit by the wisdom contained in its pages. Many after reading it should have dispelled from their minds some of the generally accepted notions about the care and training of children. For example Dr. Isaacs says that many parents who wish to be modern feel that they should leave the young child to himself most of the day, except for such routine times as eating, toileting, sleeping, and dressing and undressing. She feels, however, that if the baby is alone too much he may become bored and resort to finger-sucking and other similar behavior. Also that precious time may be lost—perhaps forever—which wisely used, could help in the building up of fine relationships between the child and its parents.

Striking statements reveal a philosophy which should instill self-confidence into parents and put them more at ease. "With time for their development, and the sense of our cheerful confidence, children will grow out of the behavior most of us worry about." And again, "It is a help to us in dealing with babes and young children merely to know that even those things they do which seem undesirable to us may be normal ways of growth."

But with all of this seeming casualness the author does not leave the adult feeling that he has no job of child-guidance, or that children will just grow out of their difficulties without help. She does simply and clearly get to the bottom of these difficulties, point out

possible reasons for various kinds of so-called "undesirable behavior" and ways of meeting it, "calmly and therefore more wisely." The book is highly recommended for its sound practicality.

ETHEL L. GORDON

Food Values of Portions Commonly Served—By Anna DePlanter Bowes and Charles F. Church. Philadelphia (3621 Woodland Ave.): E. P. Dolbey & Co., 1937. 12 pp. Price, \$.50.

This booklet consists of a table giving the protein, fat, carbohydrate, calcium, phosphorus, and iron content of foods, as expressed in grams per measures or portions frequently served. Values for vitamin A, B, C, D, and G are given in Sherman units, the energy values in calories, and the excess of acid or base values in cubic centimeters of normal solutions. The data, compiled and calculated from authoritative sources, have been conveniently arranged and classified for ready reference.

The table should prove useful to dietitians, nurses, and others in formulating special diets.

D. BREESE JONES

Allergy: Its Practical Application—By J. A. Rudolph, M.D. Philadelphia: Dorrance, 1937. 224 pp. Price, \$3.00.

This is a concise and well written book, embodying the extensive experience of the author as well as that of other well known workers in this new field.

We are glad to note the statement in the preface that allergy is as much a specialty as any of the other fields of medicine and that it is not limited to the making of a few skin tests which almost any physician can do with a fair amount of success. The author believes that this impression has been created largely by the detail

men of commercial drug firms. Certainly the interpretation of such tests and the practical application of measures indicated by them is a specialty and should be reserved for those who have given considerable study to the subject. While the author goes into treatment there is also much concerning prevention, especially by mechanical means, as the screening out of dusts, pollen, etc., and there is a chapter on The Immunology of Allergy well worth reading.

The book ends with an extensive bibliography in which, however, there are a number of mistakes. It is also rather confusing to find on the first page references starting with 142. The book can be recommended for those for whom it is designed. The printing and make-up are good.

MAZÛCK P. RAVENEL

Sanitary Engineering as a Career: A Monograph (from "Careers")—The Institute for Research Devoted to Vocational Guidance, 537 South Dearborn Street, Chicago, Ill., 1938. 20 pp. Price, \$1.00.

The profession of sanitary engineering evolved with the discovery that certain microscopic organisms and bacteria are the causes of some of the worst human diseases. In attempting to minimize the harmful effects of such organisms, the sanitary engineer has been primarily engaged in designing and building structures to promote cleaner and more healthful environments. However, "it has not been so many years ago when people generally thought of the field of sanitary engineering as one limited to questions of water supplies, stream pollution, trade wastes, and the collection and disposal of garbage and sewage.

"Engineering methods have proved so successful that now they are being applied in many other lines of sanitation, and at present the sanitary engineer is

called upon to deal also with pasteurization of milk; protection of oyster-growing areas; problems of housing, such as overcrowding, light, heat, and ventilation; malaria control; plague eradication; destruction of vermin; industrial sanitation; smoke abatement; noise reduction; protection of swimming pools and bathing beaches; special hazards of comparatively recent importance, such as poisonings by refrigerants, chemicals used in fumigation, and by hair dyes, shoe dyes, moth-proofing compounds, and like products; and the abatement of nuisances of many kinds."

In performing this work, the engineer may be employed by a government service, manufacturer of sanitary engineering equipment, a consulting engineer, or an industry having problems in disposing of their waste products.

While the responsibilities of the profession are generally large the monetary returns are small. The sanitary engineer derives satisfaction from the wide variety of interest his profession presents, the opportunity for associating with successful men of other professions, and the realization that he is engaged in doing decidedly worth while things.

ARTHUR P. MILLER

The Biology of Arteriosclerosis—
By M. C. Winternitz, M.D., R. M. Thomas, M.D., and P. M. LeCompte, M.D. Springfield, Ill.: Thomas, 1938. 142 pp. Price, \$4.00.

The work recorded in this volume will unquestionably serve as the opening wedge into the wilderness of unknowns that have masked the pathogenesis of arteriosclerosis through the

ages. There, of course, are limitations to the application of the principles developed, but one can with little imagination see their application to studies in a number of diseases affecting the vascular system.

The authors are to be commended for their foresight and for carrying through a personally developed idea in such a clear-cut manner. The volume is unusually readable, in good diction, well prepared and organized, and in such language that anyone of general scientific training can understand. The photomicrographs and drawings, many of which are in remarkable color reproductions, illustrate the work to a very unusual degree. The methods of clearing the specimens for purposes of interpretation and illustration add great value.

M. PINSON NEAL

Eat and Keep Fit—By Jacob Buckstein, M.D. New York: Emerson Books, 1938. 128 pp. Price, \$1.00.

The author presents in popular style the science of nutrition and its relation to health and general well being. The various food elements are discussed in a logical and interesting manner. The chapter on false notions about food combinations and food fads and their fallacies is very well presented and should prove instructive to the layman. Exception may be taken to a number of apparently loose statements, which need further explanation. The book ends with a timely chapter on sane diets to lose or to gain weight. This book should prove of value in educating the person not versed in nutrition as to the importance of diet and its influence on good health.

C. R. FELLERS

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Preventing Pneumonia—Being the very last word in the diagnosis, prevention, and care of pneumonia, this valuable committee report should be studied by all. What some states and cities have already done toward meeting their responsibilities is recorded and what remains to be done is convincingly stated.

AXON. Pneumonia Mortality and Measures for Prevention. Pub. Health Rep. Supp. 142 (July), 1938.

Deaths Down, Births Up—For the registration area, the death rate was lower, the infant mortality rate lowest in history, while the birth rate was higher than either of the past 2 years. The provisional figures for 1937 are: 11.2; 54.4; 17.0 respectively. Gratifying as the infant death rate is, there are indications that it can be improved, for some large cities have rates almost half the national average.

AXON. Provisional Birth, Death, and Infant Mortality Rates for 1937. Pub. Health Rep. 53, 26:1072 (July), 1938.

Further Light on Scandinavian Venereal Disease Prevention—Investigating venereal disease control programs in Scandinavian countries, this British Commission discovered that the compulsory features do not meet serious opposition, and that extreme measures are seldom necessary. Why venereal disease control works well in these countries is explained, but the point is made that the same situations do not exist in England. Though syphilis has been markedly reduced, gonorrhea has not.

AXON. Anti-Venereal Measures in Scandinavia. Brit. M. J. June 11, 1938, p. 1277.

Preventing Neonatal Deaths—Neonatal deaths have not declined as have infant deaths. This Chicago study indicates that improvement in obstetric care, the avoidance of certain drugs, measures to prolong pregnancy, and proper resuscitation would make the statistics better.

BUNDESEN, H. N., *et al.* Factors in Neonatal Deaths. J.A.M.A. 111, 2:134 (July 9), 1938.

Where More than Medicine Is Needed—Who will question these findings? Tuberculosis precipitates economic family problems. Infection cannot be controlled in families with incomes below subsistence level. Some medical services are wasted because social needs are not met. Tuberculosis prevention programs generally have not accepted economic responsibilities. Some relief is now available, but extension of services is needed in most communities.

BURRITT, B. B. Social and Economic Problems in the Control of Tuberculosis. Milbank Quart. 16, 3:287 (July), 1938.

The Grim Reaper's Tuberculosis Harvest—Some gloomy findings about deaths among tuberculosis cases which health educators would do well to keep in the back of the mind when optimistically telling the world that early discovery means early recovery. More than a fifth of the minimal cases were dead after 5 years, and nearly half those moderately advanced had died.

DOWNES, J. A Study of Mortality among Individuals with Active Tuberculosis. Milbank Quart. 16, 3:304 (July), 1938.

Questioning Some Influenza

Theories—Though most recent influenza epidemics have been due to the same virus, some, however, have been shown to be caused by a different one. Immunity to influenza does result from infection, but the degree of immunity varies. Many epidemiologic problems are recognized but cannot be answered in the present state of our knowledge.

FRANCIS, T., JR. The Immunology of Epidemic Influenza. *Am. J. Hyg.* 28, 1:63 (July), 1938.

British Health Services—American sanitarians and medical leaders who are inclined to work up a lather over preventive and curative medical relationships would do well to read the unimpassioned discussion of the needs in British public health which visualizes greatly extended health services, a closer relationship between hospitals, and health insurance, the latter service to include dependents.

FRAZER, W. M. State Medicine and Industrial Hygiene. *J. Roy. San. Inst.* 1, 10:587 (July), 1938.

Levaditi Did It First—If you are curious to know who invented the hen egg as a culture medium and to what bacteriologic, biologic, and immunologic uses the poor chick embryo has been put during recent years, you will find this paper a goldmine of information.

GOODPASTURE, E. W. Some Uses of the Chick Embryo for the Study of Infection and Immunity. *Am. J. Hyg.* 28, 1:111 (July), 1938.

Heat, Humidity, and Health—Excessive death rates from heat exhaustion and conditions in which it is a secondary cause bounce up with the first major heat wave. Excess mortality is slight with succeeding hot spells. The Central states are most frequently affected, but sometimes the North Atlantic states cities suffer the same experience.

GOVER, M. Mortality During Periods of Excessive Temperature. *Pub. Health Rep.* 53, 27:1122 (July 8), 1938.

Protecting Uncooked Pork Ad-dicts—Pasture raised swine are generally free from trichinae; garbage fed swine have a high incidence of infection. Human trichinosis depends upon food habits of individuals plus the amount of infection in swine. Should we require the cooking of meat in the garbage that is fed to swine?

HALL, M. C. Studies on Trichinosis. *Pub. Health Rep.* 53, 26:1086 (July 1), 1938.

Children's Permanent Teeth—Out of that rich mine of hygienic information, Hagerstown, come some unhappy findings about elementary school children's teeth. It appears that carious defects appear in permanent teeth 6 times as fast as they are cared for; and that to do a proper job in this one field alone, it would take a tenth of the time of all the dentists available.

KLEIN, H., and PALMER, C. E. The Dental Problem of Elementary School Children. *Milbank Quart.* 16, 3:267 (July), 1938.

Doubts about T.B. Programs—Because many are infected but only a few contract tuberculosis, a host of questions are raised. So many in fact, that the author doubts whether the antituberculosis measures now employed may certainly be assumed to be sufficient to solve the problem. A usefully disturbing paper.

MILLER, J. A. Some Unsolved Problems of Tuberculosis. *J.A.M.A.* 111, 2:111 (July 9), 1938.

Effective Leadership at Work—We pay for disease whether we cure it or not. We have far to go before we shall have taken up the lag for preventive medicine between what we know and what we do. These two striking statements of frequently suggested ideas are culled from this general presentation of the U.S.P.H.S. Program.

PARRAN, T. The Work and Aims of the United States Public Health Service. *New Eng. J. Med.* 219, 3:75 (July 21), 1938.

Critical Appraisal of Tuberculosis Prevention—Ways must be found to help the families of tuberculous patients. Unless financial problems can be solved, the total benefit of existing treatment facilities cannot be secured, and it becomes futile to create more institutions for care of cases, badly needed though they be. Better case finding and case holding programs are also indicated.

PLUNKETT, R. E. *Tuberculosis Control*. *Am. Rev. Tuberc.* 37, 6:612 (June), 1938.

Soup for Babies—Canned vegetable soup added to infants' diet at the first visit to the clinic did not produce any digestive upsets, but it did not significantly influence growth.

POOLE, M. W., *et al.* *Addition of Vege-*

table Soup and Strained Vegetables to Diet of Artificially Fed Infants. *Am. J. Dis. Child.* 55, 6:1158 (June), 1938.

Decentralized Health Administration—New York City health centers, each serving a population greater than most large cities, give promise of solving the otherwise insoluble health administrative problems of the world's greatest accumulation of human beings. Although the building program which will comprise thirty districts is not complete, the 4 year experience of the first units has demonstrated the practicability of the scheme.

RICE, J. L., and BARNARD, M. W. *Four Years District Health Administration in New York City.* *Milbank Quart.* 16, 3:253 (July), 1938.

BOOKS RECEIVED

MEDICAL AND LEGAL ASPECTS OF TUBERCULOSIS AS AN OCCUPATIONAL DISEASE AND AS AN ACCIDENTAL INJURY. By Mary Graham Mack. New York: National Tuberculosis Association, 1938. 188 pp. Price, \$1.00.

TUBERCULOSIS HOSPITAL AND SANATORIUM DIRECTORY, 1938. New York: National Tuberculosis Association, 1938. 168 pp. Price, \$1.00.

A TEXTBOOK OF GENERAL BACTERIOLOGY. By Edwin O. Jordan. 12th ed. Philadelphia: Saunders, 1938. 808 pp. Price, \$6.00.

A TEXTBOOK OF BACTERIOLOGY. By Thurman B. Rice. 2nd ed. Philadelphia: Saunders, 1938. 563 pp. Price, \$5.00.

THE AMERICAN RED CROSS. Swimming and Diving. Philadelphia: Blakiston, 1938. 271 pp. Price, \$.60.

DISEASES OF THE SKIN FOR PRACTITIONERS AND STUDENTS. 2nd ed. By George Clinton Andrews. Philadelphia: Saunders, 1938. 899 pp. Price, \$10.00.

HEALTH AND UNEMPLOYMENT. Some Studies of Their Relationships. By Leonard C. Marsh, A. Grant Fleming and C. F. Blackler. New York: Oxford University Press, 1938. 243 pp. Price, \$3.00.

VITAMIN B1 AND ITS USE IN MEDICINE. By Robert R. Williams and Tom D. Spies. New York: Macmillan, 1938. 411 pp. Price, \$5.00.

THE VITAMINS AND THEIR CLINICAL APPLICATIONS. A Brief Manual. By Prof. Dr. W. Stepp, Doz. Dr. Kuhnau and Dr. H. Schroeder. Translated by Herman A. H. Bauman. Milwaukee: Vitamin Products Co., 1938. 178 pp.

A TEXTBOOK OF BIOCHEMISTRY. By Roger J. Williams. New York: Van Nostrand, 1938. 525 pp. Price, \$6.00.

TUBERCULOSIS CLINIC MANUAL. By Herbert R. Edwards. New York: National Tuberculosis Association, 1938. 57 pp. Price, \$.50.

TECHNICS FOR THE BACTERIOLOGICAL EXAMINATION OF DRINKING GLASSES. Fifteen methods currently in use. *Health Officers' News Digest*, Public Health Committee of the Cup and Container Institute, 30 Rockefeller Plaza, New York, 1938. 10 pp. Mimeographed. Free upon application. (Incorrectly listed in August Journal as "Technics for the Bacteriological Examination of Drinking Water.")

THE TECHNIQUE OF CONTRACEPTION: An Outline. 4th ed. By Eric M. Matsner, M.D. Foreword by Frederick C. Holden, M.D. New York: The National Medical Council on Birth Control, 501 Madison Avenue, 1938. 50 pp. Price, \$.50.

"PYREX" LABORATORY GLASSWARE CATALOG (LP-18). Corning Glass Works, Corning, N. Y., 1938. Contains 2,353 items (700 listed first time). 128 pp.

ASSOCIATION NEWS

THE KANSAS CITY MEETING

THIS is the last but one issue of the *Journal* to bring to the membership news and notes of the Kansas City Annual Meeting.

Railroad rates, hotel information, Local Committee plans for entertainment and inspection trips, the preliminary program of the scientific sessions have all been published. Last month's *Journal* conveyed a considerable portion of this information and should be consulted. It will answer the most frequently asked questions. A news letter to the membership is in preparation and will be mailed immediately after Labor Day. An attempt will be made therein to catch all loose ends together and refer readers by page and number to details previously published and to summarize what is in store for us at Kansas City. The Chairman of the Local Committee for the 67th Annual Meeting, Dr. Edwin Henry Schorer, will tender by mail on or about October 1 his assurances to all that a hearty welcome awaits them in his city.

While the dates for the meeting have been widely publicized as October 25-28, Tuesday to Friday, inclusive, it must be pointed out that much of interest awaits the early arrival in Kansas City, whether or not he or she is a member of the several organizations which will meet on Monday, October 24. The Conference of State Sanitary Engineers and the Conference of State Laboratory Directors will hold meetings limited to their constituents. The American School Health Associa-

tion, on the other hand, will exclude no one from the interesting session planned for Monday afternoon. The International Society of Medical Officers will sponsor an Institute on the Practical Administration Affairs of the Health Officer on Monday. All health officers and public health workers interested in administrative problems are cordially invited to attend. There will be meetings both morning and afternoon. The program in full will be published in the October *Journal*. The latch string is out for all to attend the dinner meeting Monday evening sponsored by the Association of Women in Public Health. And the local public health workers organized in the Missouri Public Health Association ask us to extend an invitation to everyone to drink a cup of tea with them between 5 and 7 on Monday and meet many of the members of the Local Committee.

A considerable number of delegates from the East, whether they arrive on Monday, Tuesday, or earlier, are anticipating their first ride on the Santa Fe's streamlined trains between Chicago and Kansas City. This rapid service is only 5 months old and deserves a trial. The Santa Fe's advertisement, on page XVI tells all about it.

Those who will drive to Kansas City are probably well provided with road maps and directions. If any doubts arise as to best roads and routes, the Convention and Visitors Bureau in Kansas City or Dr. Schorer's office will be glad to lend a helping hand.

Although the Program Committee, the Local Committee, and the Association office have tried to anticipate all inquiries and provide information before it is asked for, it is safe to say that items of interest will present themselves as the meeting approaches, and readers are urged to consult this section of the October *Journal* for last minute announcements.

In making application for hotel accommodations, it is necessary that four choices of hotels be indicated and that a reasonable range of rates desired be shown. Whenever possible, arrangements should be made for occupancy of double rooms; only a limited number of single rooms are available.

HOUSING COMMITTEE
1028 Baltimore Avenue
Kansas City, Missouri

Date.....

Please make hotel reservations noted below:

Hotel First Choice Hotel Third Choice

Hotel Second Choice Hotel Fourth Choice

...Double Rooms with bath for persons. Rate desired \$... to \$... per day

...Single Rooms with bath..... Rate desired \$... to \$... per day

...Suites—Parlor, ...Bedroom(s) with bath for ... persons. Rate desired \$... to \$... per day

Special Instructions

.....

.....

Arriving, hourA.M.P.M. Leaving

If the hotel of first choice is unable to accept the reservation, the Housing Committee will endeavor to comply with your second, third or fourth choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

NAME

STREET ADDRESS

CITY

STATE

.....
.....
.....

(Please attach sheet listing additional names if necessary)

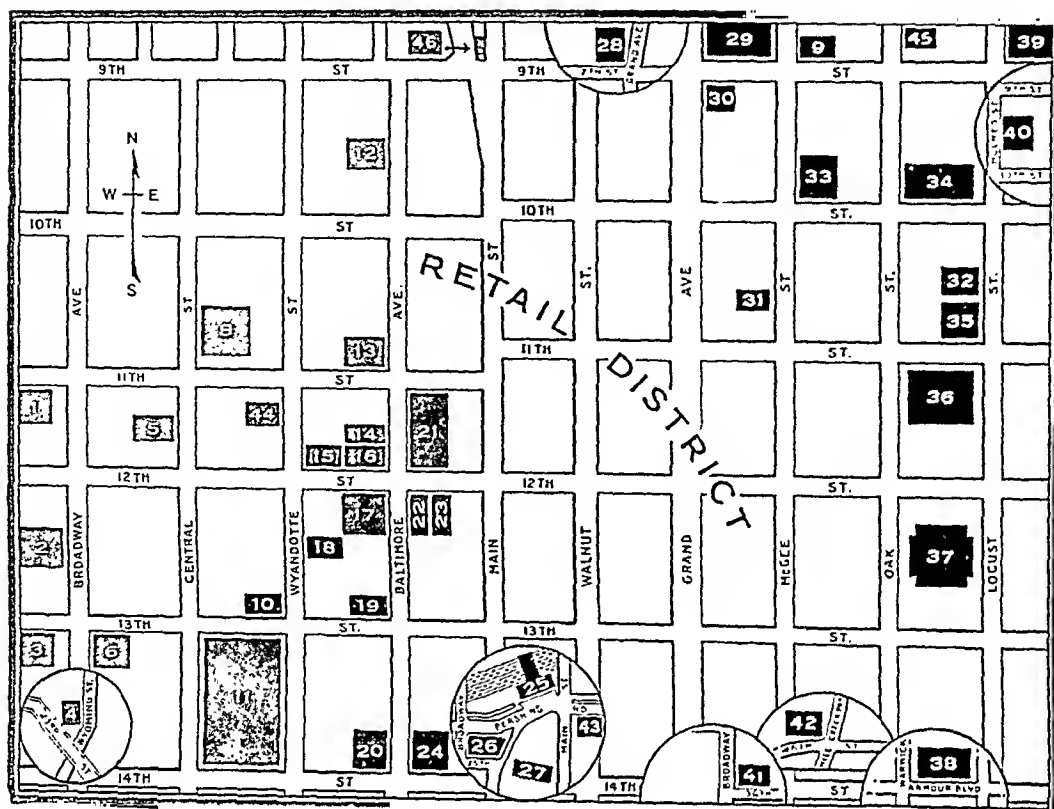
Name

Firm Name

Mailing Address

City State

(See page 1142 for 1952)



HOTELS—(All Rates Quoted are for Rooms with Bath)

Map No.	Hotel	Address	Rates	
			Single	Double
18	Aladdin	1213 Wyandotte	\$2.00-\$2.50	\$3.00-\$5.00
21	Baltimore	12th and Baltimore	\$2.00-\$3.50	\$3.00-\$6.00
38	Bellerive	214 East Armour	\$2.50-\$4.00	\$4.00-\$5.00
14	Bray	1114 Baltimore	\$1.50-\$2.50	\$2.50-\$3.50
40	Chase	911 Holmes	\$1.50	\$2.50
2	Commonwealth	12th and Broadway	\$2.00-\$3.00	\$3.00-\$5.00
22	Dixon	12th and Baltimore	\$2.00-\$3.50	\$3.50-\$5.00
32	Drake	1016 Locust	\$1.50	\$2.50
41	Hyde Park	36th and Broadway	\$3.00-\$7.00	\$3.50-\$10.00
13	Kansas Citian	11th and Baltimore	\$2.50-\$4.00	\$3.50-\$7.00
17	Muehlebach	12th and Baltimore	\$3.00-\$6.00	\$4.50-\$8.00
42	Park Lane (Apartments)	4600 Mill Creek Parkway	\$3.00-\$5.00	\$4.00-\$7.00
16	Phillips	12th and Baltimore	\$2.50-\$4.00	\$4.00-\$6.00
33	Pickwick	10th and McGee	\$2.50-\$4.00	\$3.50-\$5.00
43	Plaza	13 East 24th	\$1.50-\$2.50	\$2.50-\$3.50
24	President	14th and Baltimore	\$2.50-\$3.50	\$3.50-\$8.00
44	Rasbach	1116 Wyandotte	\$1.50-\$2.50	\$2.50-\$3.50
10	Robert E. Lee	13th and Wyandotte	\$1.75-\$2.50	\$2.75-\$3.50
23	Sexton	917 Oak	\$2.00-\$2.50	\$3.00-\$5.00
45	Snyderhof	15 West 12th	\$1.50-\$2.50	\$2.00-\$4.00
15	Stats	9th and McGee	\$2.00-\$3.50	\$3.00-\$6.00
9	Victoria	Main and Delaware at 9th	\$1.50	\$2.00
46	Westgate		\$1.50-\$2.00	\$2.00-\$3.00

HALLS

Map No.	Hall	Address
11	Municipal Auditorium	13th to 14th, Wyandotte to Central
4	American Royal Building	23rd and Wyoming
8	Ararat Temple	11th and Central
20	Edison Hall	1330 Baltimore

PUBLIC BUILDINGS

Map No.	Building	Address
36	City Hall	414 East 12th
13	Convention Bureau, Chamber of Commerce	1028 Baltimore
37	Court House	415 East 12th
29	Federal Building	815 Grand
20	K. C. Power and Light Building	1330 Baltimore
27	Liberty Memorial	Union Station Plaza
26	Post Office	315 West Pershing Road
39	Public Library	506 East 9th
25	Union Station	30 Union Station Plaza

CLUBS

Map No.	Club	Address
5	Eagles Club	1108 Central
28	Elks Club	120 East 7th
13	Kansas City Athletic Club	11th and Baltimore
19	Kansas City Club	13th and Baltimore
12	University Club	918 Baltimore
34	Y.M.C.A.	10th and Oak
31	Y.W.C.A.	1020 McGee

CHURCHES

Map No.	Church	Address
1	Cathedral	411 West 11th
35	First Christian Church	11th and Locust
3	Grace and Holy Trinity (Episcopal)	415 West 13th
30	Grand Avenue Temple (Methodist)	9th and Grand
6	West Side Branch Baptist	1301 Broadway

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

William H. Ball, M.D., Apalachicola, Fla.,
Director, Franklin and Gulf County Health
Unit
Thomas H. Biggs, M.D., Thurston County
Court House, Olympia, Wash., Health
Officer, Thurston-Mason-Olympia District
Edward R. Harris, M.D., Township Hall,
Kirkland Lake, Ont., Canada, Medical
Officer of Health, Township of Teck
Samuel Hyman, M.D., C.P.H., 18 Pearl St.,
Utica, N. Y., Assistant District State Health
Officer
Edwin H. Jorris, M.D., 200 Pearl St., Sparta,
Wis., District State Health Officer
R. W. Kite, M.D., Court House, Bellingham,
Wash., Whatcom County Health Officer
Richard A. Koch, M.D., Whitman County
Health Dept., Colfax, Wash., Health
Officer
Fred K. Laurentz, M.D., Bell County Health
Unit, Temple, Tex., Assistant Director
Norman E. Magnussen, M.D., Pierce County
Health Dept., Tacoma, Wash., Health
Commissioner
Joseph A. Markley, M.D., Main St., Weston,
W. Va., Lewis District Health Officer
Frank M. McHugh, M.D., 17 Exchange
Place, Salt Lake City, Utah, Member,
Board of Health
A. Erin Merkel, M.D., Court House, Med-
ford, Ore., Jackson County Health Officer
Frank R. Mount, M.D., Medical Arts Bldg.,
Portland, Ore., Member, State Board of
Health
Edward E. H. Munro, M.D., Grand Junc-
tion, Colo., City Physician.
Henry Raile, M.D., 19 S. Wolcott St., Salt
Lake City, Utah, Assistant City Health
Commissioner
Guy V. Rice, M.D., Jesup, Ga., Wayne
County Commissioner of Health
David R. Rich, M.D., Union County Health
Unit, LaGrande, Ore., Union County
Health Officer
Peter H. Rozendal, M.D., Klamath County
Health Dept., Klamath Falls, Ore., Health
Officer
Robert H. Trimble, M.D., Court House,
London, O., Health Commissioner
T. Oscar Vinson, M.D., Griffin, Ga., Health
Officer, Griffin and Spalding County

Laboratory Section

Avery Caine, 228 Douglas St., Salt Lake
City, Utah, Laboratory Technician, Idaho
Falls Latter Day Saints' Hospital (on
leave)
Robert T. Foster, 207 W. Market St., War-
rensburg, Mo., State Bacteriologist
Thomas L. Hartman, 804 Neches St., Austin,
Tex., Bacteriologist, State Dept. of Health
Vladimir G. Isvekov, M.D., 1403 Elgin Ave.,
Houston, Tex., Director, Medicolegal Labo-
ratory
Bernadine S. Langlie, 2300 Franklin Ave.,
Seattle, Wash., Bacteriologist-Serologist,
State Dept. of Health
Morris Silverman, 2653 S. Cloverdale Ave.,
Los Angeles, Calif., Bacteriologist, Bureau
of Venereal Diseases, State Dept. of Public
Health
John E. Van Amburgh, 613 S. Main St.,
Colfax, Wash., Milk Sanitarian, Whitman
County Health Dept.

Vital Statistics Section

Marion A. Hellert, R.N., 148 E. Gorham St.,
Madison, Wis., Bureau of Vital Statistics,
State Board of Health
Elmer S. Rosenthal, Rm. 10, Municipal
Courts Bldg., St. Louis, Mo., Registrar of
Vital Statistics
Donald W. Skeel, M.D., 756 S. Spring St.,
Los Angeles, Calif., Medical Director,
Occidental Life Insurance Co.
Alfred A. Willander, M.D., 135 S. LaSalle
St., Chicago, Ill., Medical Director, Mutual
Trust Life Insurance Co.

Public Health Engineering Section

Huger M. Bryant, St. George, S. C., Sani-
tarian, Dorchester County, State Board of
Health
John M. Dewey, District 5, State Board of
Health, Salem, Mo., District Public Health
Engineer
W. P. Henderson, 7742 Jones Ave. N.W.,
Seattle, Wash., Shellfish Sanitarian, State
Dept. of Health
Robert G. Meldrum, 814 Enosleigh Court,
Upper Woburn Pl., London, W.C.1, Eng-
land, Architect and Consultant
Lloyd A. Morley, 1401 Smith Tower, Seattle,
Wash., Camp Sanitarian, State Dept. of
Health

John R. Mudge, 223 Center St., Los Angeles, Calif., President, Chemical Equipment Co.
 Kaarlo W. Nasi, Old National Bank Bldg., Colfax, Wash., Sanitary Engineer, Whitman County Dept. of Health
 Clyde T. Norman, City Hall, Dallas, Tex., Sanitary Engineer, Water Department
 Herbert M. Packer, Rm. 621, City Hall Annex, Philadelphia, Pa., Chief, Division of Housing and Sanitation, Dept. of Health
 Robert F. Portman, Municipal Bldg., La Junta, Colo., Sanitarian, Otero County Health Unit
 Walter R. Shell, Livingston, Tenn., Sanitation Officer, Upper Cumberland District Health Dept.
 Meredith H. Thompson, Dr. Eng., C.E., Fort Valley, Ga., Assistant Division Engineer, State Board of Health
 Roy M. Wiley, 1412 Smith Tower, Seattle, Wash., Milk Sanitarian, State Dept. of Health

Industrial Hygiene Section

Fred S. Parney, M.D., Dept. of Pensions and National Health, Ottawa, Ont., Canada, Chief, Division of Industrial Hygiene
 Samuel T. Stafford, 4059a W. Belle Pl., St. Louis, Mo., Graduate Student

Food and Nutrition Section

Elvin G. Cole, D.V.M., 216 L St., Salt Lake City, Utah, Assistant Chief Sanitarian, Board of Health
 Margurite J. Fletcher, 116 N. W. Temple, Salt Lake City, Utah, Restaurant Inspector, Board of Health
 Ariel C. Merrill, Public Safety Bldg., Salt Lake City, Utah, Chief Sanitarian, Board of Health
 Charles A. Remy, 967 Yale Ave., Salt Lake City, Utah, Milk Sanitarian, Board of Health
 Stephen J. Wolff, 1001 S. Grand Blvd., St. Louis, Mo., Research Div., Pevely Dairy Co.

Child Hygiene Section

Mildred E. Doster, M.D., 2150 S. University Blvd., Denver, Colo., School Physician
 Edward M. Jeppson, M.D., 130 Capitol Bldg., Salt Lake City, Utah, Director, Maternal and Child Health Division, State Board of Health
 F. Craig Johnson, M.D., 1850 Gilpin St., Denver, Colo., Examining Physician, Public Schools

Public Health Education Section

James R. Adams, Box 2612, Birmingham,

Ala., Assistant Secretary, Liberty National Life Insurance Co.

David S. Bennett, M.D., 225 Cuyler, Palmyra, N. Y.

Arthur W. Chance, M.D., D.D.S., Medical-Dental Bldg., Portland, Ore., Member, State Board of Health

Lyman L. Daines, Ph.D., M.D., 1366 Butler Ave., Salt Lake City, Utah, Dean of Medical School

Marie P. Fackl, M.D., 580 William St., Denver, Colo., Examining Physician, Public Schools

Lois P. Hayes, 130 State Capitol, Salt Lake City, Utah, Medical Social Work Consultant, Crippled Children's Division, State Board of Health

Ann W. Haynes, Box 327, Kentfield, Calif., Public Information Editor, State Dept. of Public Health

Charles Hilton, 1412 Smith Tower, Seattle, Wash., Director, Division of Health Education, State Dept. of Health

Benjamin Kletzky, D.D.S., 1850 Gilpin St., Denver, Colo., Operator, Dental Clinic, Public Schools

H. L. Marshall, M.D., University of Utah, Salt Lake City, Utah, Teacher and University Physician

Ruth B. McCammon, 1002 Remington St., Fort Collins, Colo., State Home Agent, Extension Service, Colorado State College

Lucile O'Reilly, 1363 Milwaukee St., Denver, Colo., Medical Social Worker, Fitzsimmons General Hospital

Maurice H. Rees, Ph.D., M.D., 4200 E. 9th Ave., Denver, Colo., Dean and Superintendent, University of Colorado, School of Medicine

Mary E. Sutherland, Colorado State College, Extension Service, Fort Collins, Colo., Child Development and Parent Education Specialist in Home Health and Sanitation

Holland E. Wight, D.D.S., Yakima Medical Clinic, Yakima, Wash.

Public Health Nursing Section

Virginia M. Adkins, 3134 S. Grant St., Englewood, Colo., County Public Health Nurse

Katherine K. Baker, State Dept. of Public Health, Santa Fe, N. M., Regional Consultant, Public Health Nursing

Dorothy H. Bayles, Blanding, Utah, Public Health Nurse, State Board of Health

Mary C. Coolidge, 4737 Brooklyn Ave., Seattle, Wash., Assistant State Advisory Public Health Nurse, State Dept. of Health

Mary L. Crosby, P. O. Box 606, Waycross, Ga., Consultant Nurse, State Dept. of Public Health

Clara H. Cunningham, Ignacio, Colo., Field Nurse, U. S. Indian Service
 Evelyn C. Horton, C.P.H., 1309 Grant St., Denver, Colo., Public Health Nursing Supervisor, Metropolitan Life Insurance Co.

Vera D. Knickerbocker, 1201 E. 16 St., Denver, Colo., Field Secretary, Colorado Tuberculosis Assn.

Urania Ostberg, R.N., Colfax, Wash., County Public Health Nurse

Mary H. Pittman, 3220 Binz, Houston, Tex., Supervising Nurse, Harris County Health Dept.

Elizabeth M. Somerville, Ridge Ave., New Cumberland, W. Va., County Health Nurse

Alice M. West, R.N., 1417 Palmer St., Miles City, Mont., Maternal and Child Health Advisory Nurse, State Board of Health

Epidemiology Section

John A. Cowan, M.D., 1021 Fifth, Bismarck, N. D., Director, Division of Preventable Diseases, State Dept. of Health

Clifton Hall, M.D., M.P.H., State Board of Health, Topeka, Kans., Director, Tuberculosis Control

James J. Quinlivan, M.D., C.P.H., Paul Smith Bldg., Saranac Lake, N. Y., Epidemiologist-in-Training, State Dept. of Health

Unaffiliated

Charles H. Boissevain, M.D., Colorado College, Colorado Springs, Colo.

Francis A. Carmelia, M.D., 112 Federal Office Bldg., San Francisco, Calif., Commissioned Medical Officer, U. S. Public Health Service

Marian V. Fegley, R.N., 415 W. 23 St., New York, N. Y., Supervising Nurse, Dept. of Health

Francis S. Finch, Faidley Bldg., Omaha, Nebr., Assistant Secretary, United Benefit Life Insurance Co.

Tomas M. Gan, M.D., C.P.H., Harvard University School of Public Health, Boston, Mass., Student (Health Officer in charge, Urban Health Demonstration Unit, University of the Philippines)

Edward W. Rowe, M.D., 1339 O St., Lincoln, Nebr., Medical Director, Midwest Life Insurance Co.

John J. Torres, D.D.S., 1301 Florida Ave., Tampa, Fla., Dentist, Hillsborough County Health Unit

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Nurse Placement Service, 8 South Michigan Avenue, Chicago, Ill., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS AVAILABLE

City-County Health Officer, population 20,000; graduate physician with public health experience or training necessary; eligible to registration in Montana. W378

Wanted—(a) Director of industrial hygiene; state appointment; no politics; \$275-\$300.

(b) Graduate nurse with college degree to serve as dormitory counselor in exclusive college for women; should be 25-35 years of

age and interested in dealing with problems of adolescent girls; unusual opportunity.

(c) County health officers; southerners preferred; positions entirely free of politics.

(d) School physicians; work administrative in character; duties include supervising sanitation facilities and participating in community health program; experience in pediatrics desirable.

Write: #75-PH, Medical Bureau, M. Burnice Larson, Director, Pittsfield Building, Chicago, Ill.

POSITIONS WANTED

ADMINISTRATIVE

Physician, M.D., Class A medical school; M.P.H., Harvard School of Public Health; extensive experience in pediatrics and school

medical service; also background of county health administration and teaching in medical school, will consider expanded opportunity in teaching or research. A302

Experienced physician, administrator, epidemiologist, and teacher, now employed, with C.P.H. from Johns Hopkins and 14 years public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, M.D., University of Cincinnati; with postgraduate training in venereal disease control, Johns Hopkins; now employed, is available for venereal disease control officer. A363

Experienced administrative health officer with excellent background is available for a responsible position with adequate salary. A375

Physician, M.D., Class A medical school; M.S.P.H., University of Michigan, 1937; now serving as district state health officer, seeks full time administrative position in city or county. A367

MATERNAL AND CHILD HEALTH

Woman physician, graduate of University of Iowa, who has directed State bureau of maternal and child health, now employed, will consider another position. C318

Woman physician with excellent medical training and background of public health nursing experience, seeks position in maternity and infancy work. C376

HEALTH EDUCATION

Young man, M.S.P.H., University of Michigan; at present college teacher of hygiene and physical education and experienced in university medical service, desires position as executive in public or private health organization. H357

Well qualified woman in health education wishes position as health coordinator or health counselor. Has wide experience, and Ph.D. from New York University. H236

Young woman, M.S., University of Minnesota, wishes position as health education director. An excellent background of experience covers directorship of a state laboratory of hygiene, health education director of a state tuberculosis association, instructor in bacteriology and health education, and executive secretary of a dairy council. H326

Young woman, M.A., Health Education, Teachers College, Columbia University; with splendid international experience, seeks position as director of health education with preference for New York City. H369

Woman, M.D., Boston University; special work Columbia and Massachusetts Institute of Technology; one year's experience in State

hospital; interested in psychiatry, desires position in the East in hospital for mental diseases, or industrial school. H248

LABORATORY

Laboratory worker, aged 27, trained at Massachusetts Institute of Technology and Boston University, and with M.S. in Biochemistry, University of Michigan; 2 years' graduate work in public health; experienced in chemical, bacteriological, and biochemical research, and with teaching experience in college hygiene, desires position in food industry involving research or control. M374

Experienced laboratory director with background of dairy products manufacture and research in control methods; University of Wisconsin, M.S. and Ph.D.; desires administrative position with food manufacturing or processing industry, or association with health department doing routine and research work in food control. L381

Bacteriologist and pathologist with wide administrative experience, Ph.D., Brown University, will consider leading position in his field. L371

Laboratory technician, B.Sc., University of Nebraska, with experience in Army, State public health laboratory, and U.S.P.H.S. field laboratory, seeks position, preferably in medical school or university. L379

SANITARY ENGINEERING

Experienced sanitary engineer, graduate of Massachusetts Institute of Technology, seeks responsible position. E372

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology; experienced in Massachusetts, Connecticut, and Kentucky; seeks position as sanitary or public health engineer with health department. E380

MISCELLANEOUS

Physician, graduate of Johns Hopkins Medical School and well qualified in medicine and tuberculosis, will consider a clinical position in the medical field. M377

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. M352

Experienced teacher in bacteriology and public health; Ph.D., Cornell; now professor in Grade A medical school, will consider teaching, executive or administrative position. M327

NEWS FROM THE FIELD

MENTAL HYGIENE SYMPOSIUM

THE National Committee for Mental Hygiene has announced a symposium on mental health, to be presented before the Section on Medical Sciences of the American Association for the Advancement of Science at the Richmond, Va., session, December 28-30, 1938. Collaborating in the enterprise are the American Psychiatric Association, an affiliated body of the A.A.A.S.; the U. S. Public Health Service; the Mental Hospital Survey Committee, composed of 8 national medical bodies; the National Committee for Mental Hygiene; and a special committee of psychiatrists who are developing the program for the symposium under the chairmanship of Dr. Walter L. Treadway, Assistant Surgeon General of the Public Health Service in charge of mental hygiene activities.

The symposium will provide an unusual opportunity to bring the problems of mental health before the forum of the A.A.A.S. and, through it, to the scientific and lay public of America. Its object will be, essentially, to bring about a synthesis of our present knowledge of the problem, to evaluate past experience, to crystallize aims and objectives, and to marshal the scientific forces of the nation for a concerted and coördinated attack on mental disorders and disease. It will be the first time in the history of American psychiatry and the mental hygiene movement that the subject has received the special attention of this scientific body as a major topic on its agenda.

NEW HAVEN HOUSING AUTHORITY

THE appointment has been announced of the New Haven [Conn.] Housing Authority, of which Professor C.-E. A. Winslow, of Yale University,

New Haven, is Chairman, and Elizabeth Fox, Executive Director of the New Haven Visiting Nurse Association, and Associate Professor of Nursing Education at Yale University, is a member. Other members include: James W. Hook, an industrialist, who is also Chairman of the New England Council; George W. Crawford, lawyer; and James F. Welch, Business Agent of the Bricklayers' Union.

In addition to the chairmanship of this Authority, Professor Winslow is Chairman of the Committee on the Hygiene of Housing, American Public Health Association, and a representative of the United States in the Housing Section of the Health Committee, League of Nations. He is identified also with the National Association of Housing Officials Committee on Physical Standards and Construction, and is Chairman of the American Society of Heating and Ventilating Engineers Committee on Research.

PASADENA MALNUTRITION STUDY

A JOINT project of the Pasadena, Calif., City Health Department and the Council of Social Agencies in Pasadena is a survey launched recently to determine if citizens are securing a diet adequate to prevent malnutrition.

A preliminary study of 80 families will be made immediately in coöperation with the California Institute of Technology.

BROOKLYN MATERNITY CARE

A PLAN under the auspices of the Kings County Medical Society, Brooklyn, N. Y., provides that every expectant mother in Brooklyn will receive full medical attention regardless of her ability to pay. Mem-

bers of obstetric staffs in the 49 public and private hospitals of Brooklyn will grant consultation. Except in instances where the attending physician provides evidence that the patient can afford to pay for all or part of his services, compensation will not be required.

This new program was adopted following a survey by the Committee on Maternal Welfare of the Kings County Medical Society.

NEW HAMPSHIRE OCCUPATIONAL DISEASES STUDY

A PRELIMINARY study of industries in New Hampshire, with reference to occupational disease, is being made by the New Hampshire State Board of Health. The purpose of the study is to obtain information concerning the environment associated with the various occupations which potentially may have an effect on the health of employees.

This industrial survey is a result of recommendations made in the report of the Commission for the Study of Occupational Diseases in New Hampshire to the Governor in 1937.

BIRTH REGISTRATION PAMPHLET

A FOUR-PAGE pamphlet entitled "What Happens When Birth Registration Goes Amiss?" was recently distributed to all physicians, midwives, and public health nurses by the Maryland State Department of Health.

Birth registration goes amiss because of failure to file birth certificate, giving wrong date, wrong sex, wrong name, or because of illegible writing.

SHELLFISH AREA CONDEMNED

THE sale for human food of shellfish taken from the "Great Bay Area" of New Hampshire has been banned by the State Board of Health. Analyses of clams and water from the lower part of the area have definitely shown that

shellfish taken there are unfit for food because of the contamination of rivers flowing into the area with sewage from Portsmouth, Dover, and other towns.

Studies are also in progress of clams from the mouth of the Exeter River and oysters from the Oyster River.

PASTEURIZED MILK IN ALASKA

GRADE "A" pasteurized milk is now available in the local markets of Alaska. The dairies have been graded in accordance with the U. S. Public Health Service Standard Milk Ordinance.

The only pasteurizing plant operating in the territory of Alaska has been awarded Grade "A" and an average of 400 gallons of pasteurized milk is daily being produced by this plant.

INDIANA'S INDUSTRIAL SURVEY

THE new department of the State of Indiana, the Bureau of Industrial Hygiene, is conducting a study of industrial hazards.

This survey is expected to provide a cross-section of health conditions in the factories of Indiana by checking those industries known to have hazardous health conditions.

COMMUNICABLE DISEASE CONTROL IN MICHIGAN

THE appointment of an advisory committee to assist in determining plans and policies for more effective control of communicable diseases has been announced by Don W. Gudakunst, M.D., Health Commissioner of Michigan, with the approval of the State Council of Health.

The new committee, serving in an advisory capacity to Filip C. Forsbeck, M.D., Director of the Bureau of Communicable Diseases, will include: C. D. Barrett, M.D., E. E. Martmer, M.D., Allan J. McLaughlin, M.D., C. A. Neafie, M.D., Franklin H. Top, M.D., and V. K. Volk, M.D.

ONTARIO PASTEURIZATION LAW

ONTARIO is the first Canadian province to adopt a compulsory pasteurization law.

Beginning October 1, the milk supply of all Ontario cities, towns and adjoining suburban areas will be pasteurized, and by December 31, the order will apply to the whole province.

PENNSYLVANIA CANCER CLINICS

SEVEN cancer clinics will be established by the Pennsylvania State Health Department. This plan was discussed at a recent conference of the department and a program of study and experimentation was launched as the basis for drafting legislation.

NEW YORK STATE HEALTH OFFICERS ASSOCIATION

AT the annual conference of Health Officers and Public Health Nurses, held June 28-30 under the auspices of the New York State Department of Health, in Saratoga Springs, N. Y., new officers were elected as follows by the New York State Health Officers Association:

President—Charles G. Lenhart, M.D., Spencerport

First Vice-President—Myron M. Metz, M.D., Williamsville

Second Vice-President—John H. Flynn, M.D., Troy

Third Vice-President—William H. Runcie, M.D., Freeport

Secretary—Marian Wilcox, M.D., Tonawanda

Treasurer—George S. Price, M.D., Fairport

MICHIGAN DOCTORS BECOME MAYORS

THE following physicians in Michigan have been elected Mayors of the places indicated:

Dr. Thomas E. DeGurse—Marine City

Dr. Frank V. Carney—St. Clair

Dr. Arnold R. Miller—Harrisville

Dr. Alden G. Sheets—Eaton Rapids

Dr. Buell H. Van Leuven—Petoskey

PERSONALS

Central States

DR. GEORGE H. BISCHOFF, of Akron, Ohio, has been appointed to take charge of the Maternal and Child Health Program of the Idaho State Department of Health, with headquarters at Boise.

FRANCIS HARRINGTON, M.D.,† Health Commissioner of Minneapolis, Minn., and founder and Director of the Lymanhurst Health Center, was honored at a dinner given recently at the Minnesota Union, University of Minnesota. This occasion also commemorated the 17th anniversary of the health center as a school for tuberculous children.

WILL H. MOORE, M.D.,† of Valley City, N. D., was elected President of the North Dakota Health Officers' Association, at the annual meeting recently held in Bismarck. MAYSEL M. WILLIAMS, M.D.,† of Bismarck, was elected Secretary.

DR. ALFRED G. RICE, of Northville, Mich., has been appointed Director of Tuberculosis Control in North Alabama, succeeding DR. KELLIE N. JOSEPH, of Birmingham, who retired to reënter private practice.

DR. CONRAD S. SOMMER, Medical Director, Illinois Society for Mental Hygiene, has been appointed Director of the Society, succeeding HELEN L. MYRICK, resigned.

WILMIER M. TALBERT, M.D.,† of Decatur, Ill., formerly City Physician for Decatur, has been appointed Health Officer of a new district health unit with headquarters at Clinton. The new unit includes Macon, Moultrie, Dewitt, Piatt, and McLean Counties.

MAYO TOLMAN has been appointed Director of the Division of Vital

* Fellow A.P.H.A.

† Member A.P.H.A.

Statistics in the Iowa State Department of Health, Des Moines.

Eastern States

DR. ALICE HAMILTON,* of Boston, Mass., received the honorary degree of Doctor of Science from the University of Rochester, N. Y., at its 88th annual commencement, June 20.

NINA B. LAMKIN,† formerly Health Education Consultant with the Bellevue-Yorkville Health Demonstration, New York, N. Y., has recently been appointed School Health Consultant in the Division of Maternal and Child Health, State Department of Public Health, Santa Fe, N. M.

D. Y. MOORE, M.D.,* Chairman of the Board of Health and Health Officer of Manchester, Conn., for nearly 25 years, has been appointed Medical Examiner, to succeed the late Dr. LE VERNE HOLMES.

THOMAS M. RIVERS, M.D.,† Director of the Hospital of the Rockefeller Institute for Medical Research, New York, N. Y., received the honorary degree of Doctor of Science from the University of Rochester, N. Y., at its 88th annual commencement, June 20.

RICHARD EDWIN SHOPE, M.D., of the Department of Animal and Plant Pathology, Rockefeller Institute for Medical Research, Princeton, N. J., has been awarded the Alvarenga Prize for 1938 by the College of Physicians of Philadelphia. Dr. Shope received this award in recognition of his research in influenza. The Alvarenga Prize was established by the will of Pedro Francisco deCosta Alvarenga to be awarded July 14 of each year to the author of the best memorial or unpublished essay on any branch of medicine deemed worthy of the prize.

ALLAN A. TWITCHELL,† Technical Secretary of the Committee on the Hygiene of Housing, of the American

Public Health Association, appeared before the Housing Round Table of the National Planning Conference in Minneapolis, Minn., recently, where he discussed the hygienic aspects of housing.

Southern States

DR. JOHN S. ANDERSON, of New Bern, N. C., Health Officer of Craven County, has resigned to become Health Officer of Cabarrus County, succeeding Dr. DANIEL G. CALDWELL, of Concord, resigned because of ill health.

EDWARD S. ARMSTRONG, M.D., of Augusta, Ga., has been appointed Health Commissioner of Crisp County.

DR. HENRY H. ASHER, of Ozark, Mo., has been appointed head of District No. 6—a recently formed health unit, consisting of Barton, Jasper, Newton, McDonald, Dade, Lawrence, Barry, Stone, Christian, Taney, Ozark, Douglas, Webster, and Wright Counties.

WILL H. AUFRANC, M.D.,† of Kennett, Mo., is in charge of District No. 3, a recently formed health unit including Pemiscot and Dunklin Counties.

HELEN BEAN, Public Health Nursing Consultant, U. S. Public Health Service, Washington, D. C., has been appointed director of a new bureau of public health nursing in the Michigan State Department of Health, Lansing, effective early in September.

RAY H. BIGGS, M.D.,† of New Albany, Miss., has been appointed Health Officer of Madison County, succeeding CECIL C. SMITH, M.D., C.P.H.†

ENOCH M. BRYAN, M.D.,† of Fredericktown, Mo., has been appointed

* Fellow A.P.H.A.

† Member A.P.H.A.

to take charge of District No. 4, a recently formed health unit consisting of Butler, Wayne, Bollinger, Cape Girardeau, Perry, St. Genevieve, Madison, Iron, and Washington Counties.

WILLIAM B. BUCKNER, M.D., of Moss Point, Miss., has been elected Health Commissioner of Dougherty County, Ga., with headquarters in Albany.

JAMES A. CRABTREE, M.D.,* of Chattanooga, Tenn., has been appointed to take charge of the survey of cancer of the lungs which the U. S. Public Health Service is conducting in Washington, D. C., Hospitals, as part of a national study.

RUTH E. FAIRBANK, M.D.,† Associate in Psychiatry, Johns Hopkins University School of Medicine, Baltimore, Md., has been appointed Professor of Hygiene at Mount Holyoke College, South Hadley, Mass.

CHARLES W. MEINERSHAGEN, M.D.,† of Salem, Mo., has been appointed to take charge of District No. 5, a recently formed health unit consisting of Howell, Oregon, Ripley, Carter, Reynolds, Shannon, Texas, Dent, Pulaski, Phelps, and Crawford Counties.

ROY W. MCGEE, M.D., of Ben Hill, Ga., will study for one year at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md., before taking over the position of Director of Health of Fulton County.

J. W. ROY NORTON, M.D.,† Assistant Director of County Health Work on the staff of the North Carolina State Health Department, Raleigh, N. C., has been appointed Assistant Director of the Division of Preventive Medicine.

LONSDALE J. ROPER, M.D.,* recently Associate Director of the venereal disease program of the Virginia State Health Department, Richmond, has

been made Director of Rural Health for the Department, succeeding CHARLES HOWE ELLER, M.D., Dr.P.H.*

SHIRLEY C. TITUS, R.N.,† Director of the Vanderbilt University School of Nursing, Nashville, Tenn., has resigned from that position.

DR. THEODORE L. WADDLE, of Dexter, Mo., has been appointed to take charge of District No. 2, a recently formed health unit consisting of Stoddard, Scott, New Madrid, and Mississippi Counties.

ROBERT D. WRIGHT, M.D.,† of Osceola, Mo., has been appointed to take charge of District No. 7, a recently formed health unit consisting of Bates, Vernon, Henry, St. Clair, Cedar, Benton, Hickory, Polk, Morgan, Camden, Dallas, and Laclede Counties.

FRANCES HELEN ZEIGLER, R.N., has been appointed Director of the Vanderbilt University School of Nursing, Nashville, Tenn., succeeding SHIRLEY C. TITUS, R.N.,† resigned. Miss Zeigler has served as Dean of the Nursing Division of the Medical College of Virginia since 1929.

Western States

JOHN O. RAFFETY, M.D.,† of Oakland, Calif., has been appointed Health Officer of Yale County, at Woodland, Calif.

Foreign

DR. JAMES FENTON,* of London, a member of Executive Council of the Royal Institute of Public Health and Hygiene, was recently created a Commander of the British Empire (C.B.E.). Dr. Fenton is an Honorary Member of the American Public Health Association.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

- American Association of Railway Surgeons—23rd Annual Meeting. Palmer House, Chicago, Ill. September 19–23.
- American Association of School Health. Kansas City, Mo. October 24–28.
- American Association of State Registration Executives. Kansas City, Mo. October 25–28.
- American Congress of Physical Therapy—17th annual scientific and clinical session. (Preceded by instruction seminar in physical therapy for physicians and technicians, September 7–10.) Palmer House, Chicago, Ill. September 12–15.
- American Dental Association. Hotel Statler, St. Louis, Mo. October 24–28.
- American Dietetic Association—21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9–14.
- American Hospital Association. Dallas, Tex. September 26–30.
- American Occupational Therapy Association—22nd annual. (Preceded by instruction seminar in physical therapy for physicians and technicians, September 7–10.) Palmer House, Chicago, Ill. September 12–15.
- American Public Health Association—67th Annual Meeting. Hotels Muehlebach, President, Kansas Citian, Kansas City, Mo. October 25–28.
- American Public Works Association. New York, N. Y. October 3–5.
- American Roentgen Ray Society. Atlantic City, N. J. September 20–23.
- American Society of Civil Engineers. Rochester, N. Y. October 12–14.
- American Water Works Association: Rocky Mountain Section. Townsend Hotel, Casper, Wyo. September 12–13.
- Michigan Section. Bancroft Hotel, Saginaw, Mich. September 14–16.
- New York Section. Nelson House, Poughkeepsie, N. Y. September 22–23.
- Minnesota Section. Minneapolis, Minn. September 29–October 1.
- Wisconsin Section. Milwaukee, Wis. October 10–12.
- Missouri Valley Section. Hotel Fort Des Moines, Des Moines, Ia. October 13–15.
- Southwest Section. Biltmore Hotel, Oklahoma City, Okla. October 17–20.
- Association of Dairy, Food and Drug Officials of the United States. Palmer House, Chicago, Ill. October 19–21.
- Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13–15.
- Association of Women in Public Health—17th Annual Conference. Excelsior Springs, Mo., October 23–24; Kansas City, Mo., October 24.
- California Association of Dairy and Milk Inspectors. Santa Barbara, Calif. September 6–9.
- California League of Municipalities. Santa Barbara, Calif. September 6–9.
- Conference of State Laboratory Directors. Kansas City, Mo. October 24.
- Conference of State Sanitary Engineers. Kansas City, Mo. October 24.
- Florida Public Health Association. Hollywood, Fla. December.
- Hay Fever Association of America. Sault Ste. Marie, Mich. August 10–September 20.
- International Association of Milk Sanitarians. Cleveland, Ohio. October 19–21.
- International Society of Medical Health Officers. Kansas City, Mo. October 24.

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

October, 1938

Number 10

Sylvatic Plague*

K. F. MEYER, PH.D., M.D., F.A.P.H.A.

Professor of Bacteriology, Director of the George Williams Hooper Foundation, and Director of Curricula in Public Health, University of California, San Francisco, Calif.

THE Committee on Sylvatic Plague has collected, in coöperation with the state health officers and Dr. C. R. Eskey, U. S. Public Health Service, statistical data concerning the extent of human and rodent plague as well as *Pasteurella pestis* infection of fleas and other insects on the American Continent. The pertinent observations may be summarized as follows:

EPIDEMIOLOGICAL OBSERVATIONS DURING 1937

I. HUMAN PLAGUE

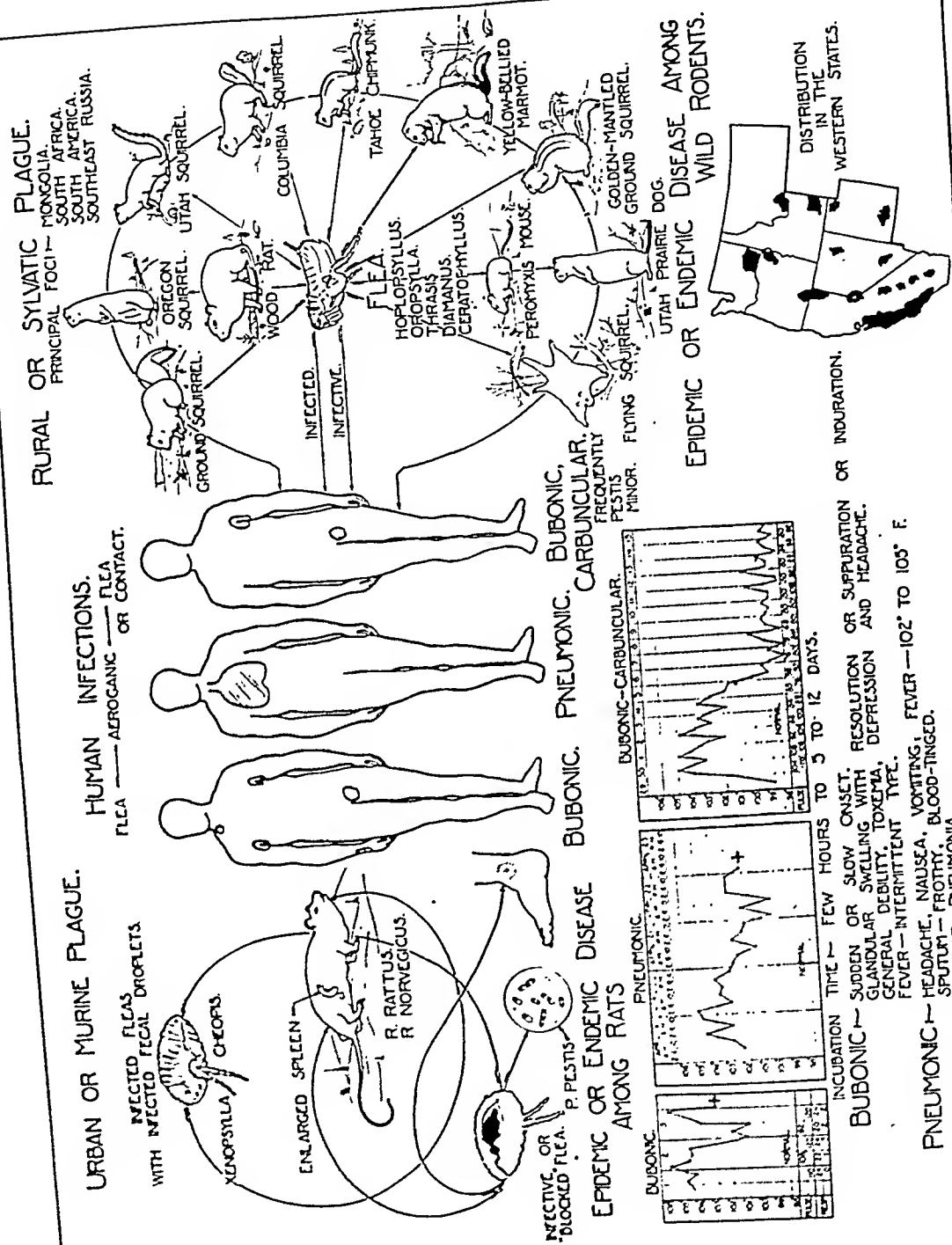
Two human cases of plague have been bacteriologically proved, one in Nevada and one in California. One terminated fatally. The histories contain observations of considerable interest:

Nevada Case—A university professor, age 64, while returning from a one day outing on May 28, 1937, from his summer home at

Zephyr Cove, Lake Tahoe, felt tired. On May 29 he had a severe chill followed by nausea and vomiting and later high fever. He became rapidly worse, began to have general aching pains throughout, more marked in the lower extremities and left groin. He was hospitalized on May 30 with a left inguinal bubo and a rectal temperature of 104.6°. On the middle third of the inner surface of the left tibia a small red area resembling a fleabite was present. This lesion changed into a necrotic scab and ulcer which healed very slowly. The puncture fluid of the edematous tender lymph node secured on May 31 yielded bacterioscopically and by culture *P. pestis*. The blood culture remained sterile. Intramuscular administration of 100 c.c. dry anti-plague serum of the Pasteur Institute and blood transfusions lowered the temperature. The patient developed a cough, but repeated examinations of the sputum failed to show plague bacilli. A transitory toxic nephritis retarded the recovery, and the patient was discharged on the 26th day of his illness.

Although infected rodents were not found in the vicinity of the summer home, fleas carrying plague bacilli were discovered in the region. The plague ulcer, which led to the development of the left inguinal bubo, resulted from a fleabite contracted on May 24 when the

* Third Report of the chairman of the Sylvatic Plague Committee of the Western Branch American Public Health Association, read before the Ninth Annual Meeting in Portland, Ore., June 6-8, 1938.



patient had worked in and around his summer home. The anti-plague serum was unquestionably responsible for the prevention of a septicemic state and the uneventful recovery.

California Case—A 7 year old girl with a history of having been bitten by a chipmunk on August 10, 1937, while on vacation at Huntington Lake, Fresno County, complained on August 14 of pain in the left arm and shoulder, vomited, had high fever, and an unusually rapid pulse. She was hospitalized on August 16, temperature of 104° F., W.B.C. 26,600, and an indurated mass in the left axilla. Sulphanilamide was given internally and local compresses were applied. A surgical exploration of the axilla on August 17 revealed an edematous infiltration and a few enlarged lymph nodes. On the 18th the patient was toxic and irrational, showed a petechial rash on the extremities, and despite a blood transfusion expired early in the afternoon. An antemortem blood culture yielded Alpha streptococci and *P. pestis*.

According to reports made by the Forest Ranger stationed at the Lake, an epidemic disease had appeared among the rodents of the area and had greatly reduced the population during the month of August. The examination of 434 rodents (218 *Citellus beecheyi*, 106 Golden mantled squirrels, 86 chipmunks, flying squirrels, rats and mice) revealed 3 ground squirrels with anatomical and bacteriologically proven lesions of plague. In addition, by *mass inoculation of organ suspensions* (8 pools) *into guinea pigs*, latent plague was demonstrated in chipmunks, Golden mantled and flying squirrels as well as mice. Infected fleas were detected through the customary injection of triturated suspensions of the insects. In 48 pools tested, 6 were found to contain fleas carrying *P. pestis*.

These two observations on human plague emphasize again the following important facts:

1. Since plague infections may be encountered anywhere in the Sierra Nevada regions, it is imperative that

the differential diagnosis be carefully weighed and surgical procedures deferred until the nature of the infective process has been established. Lymph node punctures are most useful in making an early diagnosis.

2. The early use of anti-plague serum, which is available at the Hooper Foundation and the U. S. Public Health Service laboratories in San Francisco and Hamilton, Mont., is definitely indicated.

3. The owners or guests of summer homes visiting infected areas should be instructed to rat and rodent proof their buildings and, if practical, institute measures which will reduce or eliminate the flea population in their immediate surroundings.

4. With unremitting insistence, the public, in particular children, should be warned not to touch or to play with chipmunks or other rodents in or around regions in which sylvatic plague has been demonstrated.

5. The Forest Ranger should immediately report noteworthy rodent mortalities to headquarters in order that the nature of the epizootic may be determined.

6. In recognition of the inherent danger in transferring plague to human habitations through wild rodents used as cage pets, the California State Department of Public Health in an official order dated September 14, 1937, prohibited the shipment or sale of chipmunks, Golden mantled squirrels, or other wild rodents unless these animals are held in quarantine for 2 weeks prior to shipment or sale. Consignments of rodents trapped in areas in which an animal has been found to be plague infected must be destroyed. It is recommended that similar steps be taken by the health officers in other states.

II. RODENT PLAGUE (ANATOMICAL AND LATENT)

(1) *California*—The experiences of the past 3:

years confirmed previous observations that rodents with anatomical lesions of plague may be discovered late in the season in regions in which the infection is operative in epidemic distribution. Thus it is by no means surprising that, late in September and October, 2 dead and 1 sick Beecheyi squirrels with plague lesions were dissected in the Huntington Lake area. On the other hand, the gross examination of over 6,556 small animals between May 12 and July 10, 1937, in the Lake Tahoe area failed to detect plague. Despite the demonstration of *P. pestis* in several pools of fleas collected in the Big Bear and Barton Flats areas of San Bernardino County, no anatomically marked rodents have been found among 2,255 animals. In fact, rodent plague has not been recognized in the county. The finding of plague infections without visible lesions in Oregon squirrels during the survey activities in 1935 in Lassen County prompted a radical change of the methods dealing with the examination of wild rodents during the month of August. Pieces of spleen, liver, and lymph nodes were removed from every animal during dissection. In trying out this new procedure, the organs of from 5 to 90 rodents were placed in glass stoppered bottles carefully iced and sent to the laboratory. They were washed with salt solution, ground with sand, and a proportion of 5 to 10 per cent suspended in salt solution. Cultures on blood plates were made and, if the material was not too heavily contaminated with *B. coli* and *B. proteus*, 1 to 2 c.c. of the suspensions were inoculated subcutaneously into guinea pigs. When too heavily contaminated, the injections were made intracutaneously. It is now recognized that the pools should not include the organs of more than 10 to 15 animals. Although in no instance were plague bacilli grown in the cultures prepared from the suspensions, 13 guinea pigs injected with different pools succumbed to plague as follows:

El Dorado County—132 rodents examined

October 4: 1 pool of 7 Beecheyi squirrels, 5 chipmunks, 2 wood rats, 2 Alexandrinus rats, and 3 Golden mantled squirrels.

October 19: 1 pool of 6 tamarack squirrels (*Sciurus douglasii*). Infected fleas had been found on this species in the same area in 1936.

Fresno County—515 rodents examined—98 pools of 434 animals

September 9, 1937: 1 pool of 5 chipmunks (*Eutamias*)

September 14, 1937: 1 pool of 3 Beecheyi squirrels

October 2, 1937: 1 pool of 9 golden mantled squirrels (*Callospermophilus*)

October 2, 1937: 1 pool of 14 chipmunks

October 9, 1937: 1 pool of 1 flying squirrel (*Glaucomys sabrinus*)

October 10, 1937: 1 pool of 2 white-footed mice (*Peromyscus*)

November 4, 1937: 1 pool of 6 golden mantled squirrels

The cadavers of the flying squirrels and of the field mice were available for a painstaking examination. Neither gross nor microscopic study revealed inflammatory lesions. The plague bacillus was, therefore, present as an *inapparent, invisible infection* in an undiminished state of invasiveness; the guinea pigs injected with the suspensions succumbed to pure *P. pestis* infections in from 5 to 8 days. None of the organs of the other rodents revealed lesions on inspection at the laboratory, and the personnel of the field survey crews consisted of exceedingly well trained observers who would have readily recognized even the smallest markings of plague. The incidence of invisible *P. pestis* infection among the rodents of the Huntington area may be tentatively estimated as follows: Beecheyi squirrels 3 in 253, Golden mantled squirrels 15 in 130, chipmunks 19 in 100, field mice 2 in 9, and flying squirrels 1 in 1.

During the latter part of 1937, 233 pools prepared from the organs of 1,380 rodents shot or trapped in 15 counties of California in which sylvatic plague was known to exist failed to infect guinea pigs.

Latency as a phase of an infectious disease is a well recognized biological phenomenon. Although first established by Swellengrebel and Hoesen¹ for *P. pestis* infection in rats in Sumatra, and then by William and Kemmerer² for the same rodent in New

Orleans, it has with increasing frequency been mentioned from the sylvatic plague areas in Southeast Russia and in the Trans-Baikal by several investigators. Nikanorov (1925) and Gaiski (1926), based on careful observations, came to the conclusion that susliks (*Citellus pygmaeus*) and large gerbilles (*Rhombomys opimus*) may become carriers of the plague bacillus and thus transfer the virus from one season to another. Latent and chronic plague infection involving not less than 20 per cent of the susliks in the steppes of the Ural has been studied by Konstansov,³ and Syssine⁴ saw it in tarabagans.

The demonstration of latent plague in the rodents responsible for sylvatic plague on the American Continent is a biological process which had to be anticipated. Doubtless it would have been discovered long ago had not the laborious technical difficulties been a deterrent factor. At least, in California the examination of organ pools will greatly help to clarify the epidemiology of plague among the rodents and the occasional human infections, although the elucidation of the causes remains for the present a fascinating problem. For example, one would like to know if an invisible infection may be converted into a manifest process. Grikurov, in a recent paper from the North Caucasian anti-plague organization, presents suggestive evidence that malnutrition or other environmental conditions may act as provocative factors and transform a latent into an active process, thus serving as supplying the seeds for plague epizootics early in spring. In this connection, it must be mentioned that the plague bacilli isolated from the guinea pigs, which succumbed to organ pool injections, had in the mouse pathogenicity test the same degree of invasiveness as those cultured from infected fleas or human tissues. Approximately 12 to 24

bacilli are required to cause an infection of the mouse by the intra-peritoneal route.

Nothing is known concerning the species disposition of the rodents involved in the plague areas. Individual variations in the disposition induced by biological changes are quite important. Thus it was found by Tinker and Kalabuchov that the young *Citellus pygmaeus* are the most susceptible to plague, then the adult females, and the least susceptible are the adult males. Finally, ecological and even climatological factors affecting the nutrition and population numbers greatly influence the susceptibility and the character of the plague infections.

The Russian investigators have used skin tests and serological procedures to detect invisible plague in rodents. Grikurov⁵ found that the sera of old *Citellus pygmaeus* contained agglutinins against *P. pestis*. He reasons that the increasing immunity of the rodent population, reflected in the serum reactions, may play an important rôle in the disappearance of the epidemic. That sub-lethal infections may be responsible for a part of the population immunity is fully recognized. However, two other factors play an equally important rôle. The weeding out of the susceptibles and the hereditary transmission of the resistance of the parent rodents to subsequent generations has been proved for rats, but has not been extensively studied on squirrels and other wild rodents. In view of the recent reports by Pirie (1936) that the South African plague strains obtained from both human and animal sources reveal a steady diminution in virulence, it is obviously desirable to estimate with special care, by using quantitative methods, the degree of virulence of every strain that may be isolated from wild rodents on the American Continent.

Contrary to the belief too often held

by the laity and even by those who are familiar with certain phases of plague, an epizootic among wild rodents is by no means always followed by human *P. pestis* infections. The great foci of sylvatic plague in Russia furnish many convincing examples. During June, 1913, a severe epizootic affected the suslik population of the Astrakhan steppes in the vicinity of two villages with a population of 6,000. At least 75 per cent of the 1,243 cadavers of susliks and hares scattered over the pastures proved to be plague infected; yet no case of human plague was diagnosed. Similar situations have been observed in 1930 in the steppes of the Ural. Although the factors influencing this low transmissibility are entirely unknown, these mass observations should at least alleviate to a certain extent the fear which the presence of sylvatic plague creates among misinformed groups of people.

(2) *Idaho*—According to L. J. Peterson, Director of Laboratories, the Plague Field Laboratory and the U. S. Public Health Service survey crews examined 2,213 *Citellus armatus*. In June, Dr. C. R. Eskey, U. S. Public Health Service, in charge of Plague Suppressive Measures, demonstrated *P. pestis* by mass inoculation of tissues from 47 *Citellus armatus* secured 15 miles north of Lava Hot Springs, Bannock County.

(3) *Montana*—According to Dr. W. F. Cogswell, Secretary of the Montana State Board of Health, three traveling field laboratories (one state and two U. S. Public Health Service) examined 3,204 rodents. Dr. C. R. Eskey demonstrated *P. pestis* in the tissues of 3 *Citellus elegans* (July 23, Dillon, Beaverhead County, August 20 and 23, Cameron, Madison County). The animals exhibited lesions of plague, in fact, one (August 23) was found dead as a result of a *P. pestis* infection.

(4) *Nevada*—The detailed surveys conducted both by the California and the U. S. Public Health Field Laboratories and the examination of many rodents failed to demonstrate gross anatomical rodent plague, although infected fleas were found.

(5) *Oregon*—Dr. F. D. Stricker reports that the Oregon Mobile Laboratory examined

4,973 rodents and collected 10,903 fleas. The tissues of 1 *Citellus oregonus* shot in May in Grant County and 1 *Citellus columbianus*, Wallowa County (in June) were proved by Dr. C. R. Eskey to be infected with *P. pestis*. No new areas of sylvatic plague were discovered.

(6) *Utah*—E. H. Bramhall, Director, Division of Laboratories, reports that in June the fleas removed from perfectly healthy *Citellus grammurus* near Morgan, Wasatch County, proved to be infected with *P. pestis*. The U. S. Biological Survey discovered sick *Citellus armatus*, and subsequently the Field Laboratory secured tissues from one animal which were proved by Dr. C. R. Eskey to be infected with *P. pestis*. This epizootic was in progress in Northeastern Utah near Weber, Wasatch County.

(7) *Washington*—Dr. A. U. Simpson, Chief, Division of Laboratories, Washington State Department of Health, in submitting the report by L. J. Hughes, stresses the fact that although the examinations of 1,334 rodents and wild animals of various sorts failed to reveal gross anatomical plague, batches of 33 and 18 fleas, respectively, and 3 and 5 lice, respectively, removed from 21 and 13 *Citellus townsendi* in Adams County were found by Dr. C. R. Eskey to be plague infected. Thus the existence of sylvatic plague in one of the most northern points in the United States has been definitely established, and the nature of certain fatal epizootics among rodents during 1914–1915 and 1931–1932 may ultimately be clarified.

The survey studies conducted on a scale hitherto unknown in the annals of sylvatic plague on the North American Continent have amply confirmed the suspicion that the infection is widely distributed, but difficult to recognize without mass inoculations of tissues or fleas. To the list of rodents that suffer from spontaneous plague previously reported must now be added the Sierra Nevada flying squirrel [*Glaucomys sabrinus luscivus* (Bange)] and Golden mantled squirrel [*Callospermophilus chrysodeirus chrysodeirus* (Merriam)]. Since infected fleas have been removed from the Townsend squirrel (*Citellus townsendi*), presumably this rodent is also a host for the plague bacillus.

III. SURVEYS ON INFECTED FLEAS

It has always been a disconcerting fact that in a number of instances the epidemiology of human plague (1 case 1933, 3 cases 1936) could not be explained since the anatomical examinations of the rodents shot or trapped in the vicinity of the cases yielded negative findings. Thus the sources and the spread of the plague bacillus were shrouded in a disconcerting mystery. One should have recalled that Kitasato, the Indian Plague Research Commission, and in particular Swellengrebel and Hoesen had found many years ago that in instances where infected rodents were scarce or apparently absent, it was comparatively easy to collect plague infected fleas for adequate examination. During 1936 the subcutaneous inoculations of suspension of crushed fleas removed from wild rodents into guinea pigs were conducted on a large scale. A number of important findings deserve recording:

32 fleas from	2 normal Beecheyi squirrels
14 fleas from	9 normal Golden mantled squirrels
29 fleas from	5 normal Beecheyi squirrels

Placer County—Infected area proved since 1936; 1 of 71 pools with 3,411 fleas collected from 3,537 rodents; 70 fleas from 107 normal chipmunks infected guinea pigs with plague.

San Bernardino County—No rodent plague demonstrated. Twelve of 76 pools including 4,808 fleas from 2,255 rodents infected guinea pigs.

44 fleas from	11 normal Beecheyi squirrels
78 fleas from	28 normal Beecheyi squirrels
52 fleas from	13 normal Beecheyi squirrels
78 fleas from	102 normal chipmunks
6 fleas from	7 normal Fisheri squirrels
260 fleas from	20 Golden mantled and 31 Fisheri squirrels
56 fleas from	27 Golden mantled squirrels
213 fleas from	33 normal Fisheri squirrels
194 fleas from	74 Golden mantled squirrels
521 fleas from	79 miscellaneous rodents
491 fleas from	43 Fisheri squirrels
30 fleas from	36 Golden mantled squirrels
12 fleas from	76 white-footed mice
5 fleas from	6 wood rats (<i>Neotoma</i>)

San Mateo County—During 1936, 18,729 fleas were collected from 802 rodents in 155 pools. Since it was impractical to make the necessary tests, the vials with the fleas in salt solution were stored in a refrigerator at 3° C. for 10 to 11 months. When the pools were tested in 1937, 6 were found to produce typical plague in guinea pigs. Careful field studies showed that the infected fleas had been collected from rodents present in burrows which harbored diseased rodents 20 years ago. Repeated search for infected squirrels during the past 5 years invariably resulted in negative findings. The persistence of clandestine foci of plague in close proximity to human habitation was an interesting discovery. Although the viability of *P. pestis* in stock cultures for many years is well known, the fact that the bacteria remained alive in the dead fleas soiled with a variety of microorganisms (*B. coli*, *B. proteus*, cocci,

etc.) held at ice box temperature is specially noteworthy.

Santa Cruz County—Twenty pools consisting of 5,345 fleas from 789 rodents yielded entirely negative results despite the fact that, in 1936, 7 of 35 pools consisting of 2,154 fleas proved to be infected.

(2) *Idaho*—Dr. C. R. Eskey demonstrated by guinea pig inoculations *P. pestis* from triturating 56 fleas and 1 louse from 7 *Citellus armatus* shot on June 17, 20 miles north of Lava Hot Springs, Bannock County.

(3) *Nevada*—In an extensive series Dr. C. R. Eskey has proved the existence of infected fleas in various counties of Nevada as follows:

10 fleas from 19 chipmunks
(*Eutamias frater*) in
Ormsby County

36 fleas from 52 chipmunks
(*Eutamias frater*) in
Ormsby County

95 fleas from 46 chipmunks
(*Eutamias frater*) in
Ormsby County

106 fleas from 55 chipmunks
(*Eutamias frater*) in
Douglas County

318 fleas from 200 chipmunks
(*Eutamias frater*) in
Douglas County

134 fleas and 4 lice from 3 Beecheyi squirrels in Ormsby County

(4) *Oregon*—Infected fleas were found by Dr. C. R. Eskey as follows:

56 fleas from 36 Oregon squirrels in Lake County

264 fleas from 56 Columbia squirrels in Wallowa County

(5) *Utah*—The fleas (25) collected from 2 healthy *Citellus grammurus* in Morgan County were found to be infected, while the insects removed from diseased squirrels in Wasatch County proved to be non-infected.

(6) *Washington*—Pools of fleas and lice collected from *Citellus townsendi* in Adams County proved to be infected.

Even a cursory analysis of the data on fleas demands a brief discussion. Although epidemiological and experimental data fully attest to the vital rôle of the flea in the propagation of plague both among the rodents and man, it is rarely appreciated that the vectors carrying *P. pestis* are not regu-

larly capable of transmitting the parasite.

In 1915 Swellengrebel and Hoesen, while studying plague during inter-epidemic months, made the important discovery that in 18 instances the presence of plague was demonstrated by means of the inoculation of material from 15,279 triturated fleas taken from 3,230 rats. No human cases of plague were observed during the same time. More recently George and Webster (1934), in their inquiry into plague in the Cumbum Valley in South India call attention to the important difference between *infected* (pestiferous) and *infective* (pestigenous) fleas, and that the distinction has not been sufficiently emphasized. The mere sucking of blood carrying *P. pestis* by the flea does not necessarily render it infective, *i.e.*, likely to transmit infection. Even under the most favorable conditions, only an occasional infected flea becomes blocked and capable of infecting. Neither the total number of fleas found on the rodents, not even the number of infected fleas, but the number of infective fleas is of prime importance. The physiologic-pathologic processes, which lead to the blocking of fleas, are greatly influenced by the climatic factors. Thus during the hot season very few infected fleas become infective.

Doubtless similar observations have been made by Girard (1935) in Madagascar, who tried to explain the demonstration of infected fleas on healthy rats by assuming the presence of a bacteriophage either in the vector or in the rodent.

The problem concerning infected and infective fleas has primarily been studied in connection with the vectors found on rats. The pertinent question arises: Are the facts applicable to sylvatic plague? In order to answer it, one must search the extensive field and laboratory studies published by the Russian workers in articles not readily

accessible. One realizes that the evidence—in particular the vector efficiency—regarding the fleas is by no means as well worked out as that concerning their hosts. Each rodent has its own hordes of fleas and the rôle as vectors must be analyzed individually. The studies of Golov and Ioff (1925–1927) are in this connection quite important. These two Russian workers experimented in detail with the fleas (*Oropsylla silantiewi*, *Ceratophyllus tesquorum* and *Neopsylla setosa*) of the Siberian marmot (*Citellus pygmaeus*), and the pulicidae (*Ceratophyllus mokrzeckii* and *Ceratophyllus consimilis*) of the field mouse (*Mus musculus* and *Mus musculus Wagneri*). Although nearly all types of fleas were capable of transferring plague from rodent to rodent when used in large numbers, in one test as few as 3 insects infected the experimental animals. Less successful was Bytchov (1935) who fed 624 fleas collected from tarabagans, marmots, and rat-hares (*Ochotona daurica*) on different experimentally infected rodents. In 61 individual experiments using as many as 40 fleas, not one transmission succeeded. He emphasizes the fact that transfer of the plague virus will not take place until at least a partial blocking of the proventriculus and ventriculus of the flea has taken place. In fact, a wild rodent flea infects quite irregularly either immediately after sucking infected blood or later when massive growth of the plague bacilli leads to obstruction of the proventriculus. Already in 1928 Bytchov and Borzenov by using a cultural method in seeding the intestinal tube of dissected fleas on agar noted that normal insects with no signs of “blocking” of the stomach yielded positive cultures. Tumanski and Poliak investigated 1,797 fleas recovered from a marmot nest in November; 5 fleas yielded *P. pestis* although none was blocked.

Based on these and similar observations, the Russian workers list the various modes of transmission of plague from rodent to rodent in the following order of importance:

1. Crushing of infected fleas with the teeth, infection through the mucosa of the buccal cavity with subsequent involvement of the lymph-nodes of the neck.

2. Scratching and rubbing of infected fleas, rarely fecal droppings into superficial skin wounds or abrasions.

3. Through the bite of the flea with a soiled proboscis following the sucking of blood from a diseased rodent.

4. Later as an infective-blocked insect.

Analyzing the epidemiology of sylvatic plague in its relation to man, the observers in Saratov and Trans-Baikal conclude that immediate contact with the sick or dead rodent leads to bubonic plague, while flea transmission is infrequent. The danger represented by individual fleas, therefore, appears more limited than was originally believed. Aside from serving as vectors, the wild rodent fleas act, according to the observations of Golov and Ioff, Tumanski and Poliak,⁶ and Evseeva and Firsov⁷ as “preservers” of plague infection in the burrows. Thus infected fleas obtaining an occasional meal may be alive for many months, particularly in regions where the moisture of the environment is high but the temperature low. Systematic studies concerning the influence of the “microclimate” and the burrows both on the preservation and in particular on the development of infective fleas from merely infected insects have not been made. Without a thorough understanding of the ecology of the species of fleas infecting the different rodents, it is impossible to evaluate the vector efficiency and the present-day risk of sylvatic plague to man. However, from the available information, it is

clearly demonstrated that the problem of infected versus infective flea applies also to the pulicidae of the wild rodents. In all probability, the vector efficiency plays an important rôle as has been pointed out by Eskey.

Experimental studies by Iofi and Pokrowskaja leave no doubt that the fleas of human habitations (*Pulex irritans*, *Ctenocephalus felis*, and *Ctenocephalus canis*) become readily infected, and may carry the bacteria in the intestinal tract for many days. They remain permanently infected until death but never become infective.

In considering the rôle of the infected flea, one important observation by Bytchov must not be overlooked. Eight guinea pigs used in the feeding experiments with plague infected fleas discussed in the preceding paragraphs, survived when again bitten by 10-40 plague fleas; 1 month later all 8 animals proved immune against a dose of *P. pestis* fatal to controls. These observations and those by the Indian Plague Research Commission on rats suggest to him the realization that also under natural conditions rodents bitten by infected fleas may not succumb but become actively immunized. This hypothesis deserves experimental investigation for the following reasons:

Although the flea with a stomach capacity of 0.5 cu. mm. of blood may ingest at least 5 bacilli from a rat with 10,000 plague bacilli per c.c. in the blood stream. No estimates concerning the number of bacilli which are regurgitated from a "blocked" flea are available. In fact, it is reasonable to surmise that the viscous consistency of the "block" may contribute a variable number of *P. pestis* to the inoculum. Of interest, in this connection, are the findings of Borzenov who bacterioscopically counted 70,112 and 1,026,921 plague bacilli, respectively, in 3 infected fleas. There is no standard method of testing viru-

lence except the procedure by Sokhey on mice. At least 12 to 24 bacilli are required to cause an infection by the intraperitoneal route. Probably a considerably larger number is needed to infect by the cutaneous route and, furthermore, the infective dose may vary with the species of rodent (in some recent experiments on Richardson squirrels at least 250). Finally, the ability of the flea to become infected will depend on the number of plague bacilli in the blood stream of the sick or dying rodents. Nothing definite is known regarding this phase of the problem. Feeding of wild rodent fleas on plague infected guinea pigs may not imitate the conditions as they occur in the burrows.

The absence of infected fleas collected from squirrels dead with septicemic lesions of plague still requires an explanation. Preliminary observations indicate that the method of collecting the fleas with the aid of gaseous antiseptics may not be responsible for the discrepant findings, but other important, as yet unknown, factors affecting the host-parasite relationship in the rodent play a rôle.

Both the early reports and the more recent observations emphasize the fact that handling of sick and dead rodents, occasional bites and similar accidents preceded the appearance of bubonic or carbuncular human lesions. A perusal of the 55 American case histories dealing with plague infections of supposed squirrel origin fail to report fleabites in about 40. It will always remain a matter of conjecture as to the actual number of cases which were caused by fleabites, since the allergic cutaneous response of man to those insects is decidedly different. As a rule, the bite of wild rodent fleas (*Oropsylla*, *Hoplopsylla*, etc.) produces no reaction, while the insects of human habitations are responsible for the purpura pulicosa. Certain species of fleas may be

efficient vectors of *P. pestis* between wild rodents, yet they rarely attack man. A fact which is quite often overlooked.

SCIENTIFIC INVESTIGATIONS

1. *Vector Efficiency and Plague Transmission*—Dr. C. R. Eskey will report on his exceedingly important studies at the forthcoming meeting of the Western Branch of the American Public Health Association at Portland, Oregon.

2. *Rodent Studies*—Dr. Walter M. Dickie and E. T. Ross of the California State Department of Public Health approved and supported, during the summer of 1937, a research program by Dr. Tracy I. Storer on the native rodent population in the Tahoe area. Fletcher G. Palmer, M.S. (Mammology), was engaged to conduct the studies on rodents. As might be anticipated, a 6 months program of study merely paves the way for further work. The techniques which had to be developed, in particular with respect to the trapping operations, required a great deal of time and ingenuity, and it is obviously necessary to continue the investigations for a number of years and not merely as seasonal studies. The results may be summarized as follows:

a. The rodent population in a plague area in the California mountains is quite large, and varies from 27 to 117 individuals per acre. Depletion of the rodent populations by trapping small areas is followed within 2 months by recovery to a considerable fraction of the original numbers.

b. Rodent control over a narrow belt is soon followed by re-invasion from adjacent non-poisoned areas.

c. Experimental selection of most preferred baits may lead to more effective operations.

d. The most abundant and most catholic rodents, in respect to habitat, are commonest in human habitations.

e. Capture, marking, and defleaing of wild rodents is thoroughly practicable. Limited use of this technic resulted in recapture of a number of chipmunks and squirrels from which fleas, acquired by the rodents after first release, were removed. *Thus, for the first time it is believed, data were obtained on the rate at which rodents re-acquire ectoparasites within short intervals after being defaunated.*

f. These results show that fleas are present in rodent territory in addition to those actually on the rodents. It is not unlikely that the temporary reduction of rodent hosts (through control measures) may expose human beings to greater chance of becoming host to fleas, particularly where rodent burrows and nests are in close proximity to human habitations.

g. Live trapping operations show that larger numbers of fleas are obtained by defaunating rodents captured in live traps than from rodents killed in snap traps.

3. *Entomological Studies*—As a part of the research program on the rodent population, Dr. M. A. Stewart with the assistance of Frank Tatum conducted a number of preliminary entomological studies, summarized as follows:

a. During the season, the 3,137 fleas collected from 2,032 rodents may be roughly classified into 14 genera and 21 species. The identifications are not as yet completed.

b. The incidence of flea infestation is quite variable and apparently not determined by host size.

c. A seasonal incidence in flea infestation has been observed. Shrews (*Sorex vagrans amoenus*) become more heavily infected as the season progresses; the Beecheyi squirrels show a marked increase in the magnitude of flea infestation beginning in August and still increasing in October. The flea indices on chipmunks (*Eutamias*) indicate a rise in July with a peak in

the second week in August. The Sierra Nevada chickaree differs from all other hosts in that its flea index is higher from the second week in June to the last few days in July, than during the remainder of the season during which the investigations were conducted.

d. There are indications of regional differences in flea populations of different hosts in different areas of the territory investigated.

e. A more or less constant flea population level is maintained on a rodent over a period of time, not great enough to involve factors capable of exerting an influence upon the bionomics of the fleas sufficient to bring about a change in the size of the general population. *It is quite obvious that a rodent, which has been freed of all fleas, will acquire what appears to be the normal number for that particular season of the year in a very short time, possibly within a few hours.* It is equally demonstrated that these fleas in question are active in seeking hosts. This information is very pertinent to the execution of sylvatic plague control procedures. *If rodents move into a focus of plague after rodent control measures are effected and before the fleas have died from starvation, which may require a very considerable period of time, they may be readily attacked by infective fleas and thereby maintain the focus of infection.*

f. The preliminary observations indicate that the flea indices of rodents

surviving the control operations are *not significantly different* from those collected from rodents taken in non-poisoned areas. Furthermore, taking into consideration the seasonal incidence of flea populations, there seems to be no increase in flea indices manifested after some time has elapsed following the distribution of poison.

g. Experimental studies have shown that methylbromide, administered at the rate of 10 c.c. per burrow opening, is very efficient in controlling both burrow rodents and their fleas. This fumigant, of course, must be used with the customary care accorded to all highly toxic gases.

NOTE: The Chairman of the Committee begs to express to the Executive Committee, the Health Officers, Dr. C. R. Eskey, and the U. S. Public Health Service his appreciation for the continuous assistance he was privileged to receive during the collection of data presented in the report. The liberal support given by Dr. W. M. Dickie and the State Department of Public Health has greatly broadened the knowledge in a very complex field of epidemiology; it has enabled both Dr. Tracy I. Storer and Dr. M. A. Stewart to collect information along the lines in which they are experts.

REFERENCES

1. Swellengrebel and Hoesen. *Ztschr. f. Hyg. u. Infektionkr.*, 19:436, 1915.
2. William and Kemmerer. *Pub. Health Rep.*, 38:1873, 1923.
3. Konstansov. *Centralbl. f. Bacteriol.*, I Abt., Orig. 127:440, 1933.
4. Syssine. *Bull. Office Internat. d'hyg. pub.*, 22:269, 1930.
5. Grikurov. *Rev. Microbiol. & Epidemiol.*, 13: 207, 1934.
6. Tumanski and Poliak. *Rev. Microbiol. & Epidemiol.*, 10:325, 1931.
7. Evseeva and Firsov. *Rev. Microbiol. & Epidemiol.*, 11:281, 1932.

Preventive Medicine

THE object of preventive medicine is to prevent not only the spread of disease, but its unnecessary occurrence,

to remove its occasion, to save the time which it loses, and the suffering which it causes.—Sir George Newman.

Contributions of Edward Jenner to Modern Concepts of Heart Disease

O. F. HEDLEY, M.D.*

*Passed Assistant Surgeon, U. S. Public Health Service,
Philadelphia, Pa.*

WHEN the name of a versatile person becomes associated with an outstanding achievement, posterity often fails to give due recognition to his other gifts and accomplishments. Edward Jenner is ranked among the immortal figures in medicine because he first successfully introduced preventive inoculation as we know it today. Because his name is associated with the discovery of vaccination against smallpox we are apt to lose sight of some of his other contributions to medicine.

Had Edward Jenner never observed the vicarious relationship of cowpox to smallpox he would still have been remembered among the great clinicians of his day—the Hunters, the Pitcairus, Parry, Heberden, Rush, and others. Not only was he a distinguished physician but he also made botanical and ornithological observations, played on the violin and flute, and wrote occasional poems.¹ John Hunter, his tutor and friend, a naturalist of no mean ability, although generally remembered for lifting surgery above the plane of the barber surgeons, attempted to induce him first to become a biologist and later a teacher of medicine. On

Hunter's recommendation Jenner was appointed to prepare and examine specimens which Captain Cook brought back from the South Seas, and was subsequently offered the position of naturalist to one of these expeditions.²

When Jenner, while a general practitioner in Berkeley in 1771, overheard a young woman remark "I cannot have that disease, I have had cowpox," he began considering the possibility of conferring an artificial immunity against smallpox and went to John Hunter for advice. Hunter more than atoned for his previous suggestions by counselling him²: "Don't think, try; be patient, be accurate."³

RELATION OF CORONARY ARTERY DISEASE TO ANGINA PECTORIS

In 1768 Heberden described the symptom complex which he called "angina pectoris."⁴ His ideas concerning the nature or cause of this syndrome were quite hazy. In May, 1777, John Hunter in a letter to Jenner briefly mentioned symptoms of a cardiovascular disease, from which he had suffered since 1773. In August he went to Bath for treatment. Here Jenner saw him and concluded that Hunter was suffering from angina pectoris. So greatly concerned was he that he wrote to Heberden in 1778 about

* From the Office of Heart Disease Investigations, National Institute of Health, U. S. Public Health Service. Branch Office: 133 So. 36th Street, Philadelphia, Pa. Published by permission of the Surgeon General.

their common friend's condition. In this letter he mentioned two dissections on subjects who had died of angina pectoris in which the chief morbid findings were thickening of the coronary arteries. Heberden had failed to note this, only finding sclerotic plaques in the aorta. Jenner discussed the difficulties of dissecting these vessels due to their often being embedded in fatty tissues. He states:

The importance of the coronary arteries and how much the heart must suffer from their not being able to perform their functions (we cannot be surprised at the painful spasms) is a subject which I need not enlarge upon, therefore shall only remark that it is possible that all of the symptoms may arise from this one circumstance. Should it be admitted that this is the cause of the disease I fear the medical world may seek in vain for a remedy.¹

John Fothergill, in 1776,² had described coronary sclerosis in a patient who had died of angina pectoris in 1775. He did not definitely associate the condition of the coronary arteries which "from their origin to many of their ramifications were become as one piece of bone" with the clinical manifestations. Caleb Hillier Parry, who in 1799 wrote a very clear account of the relationship of angina pectoris to coronary disease, conceded the priority of this conception to Edward Jenner.³ In the introduction Parry includes a letter from Jenner, illustrative of a subtle sense of humor as well as confidence in his views concerning the underlying cause of angina pectoris. It reads in part:

The first case I ever saw of Angina Pectoris, was that in the year 1772, published by Dr. William Heberden, with Mr. Hunter's dissection. There, I can almost positively say, the coronary arteries of the heart were not examined. Another case of a Mr. Carter, at Dursley, fell under my care. In that, after having examined the most remote parts of the heart, without finding any means for which I could account for his sudden death, or the symptoms preceding it, I was making a

transverse section of the heart pretty near its base when my knife struck against something hard and gritty, as to notch it. I well remember looking up at the ceiling, which was old and crumbling, conceiving that some plaster had fallen down. But on a further scrutiny the real cause appeared: The coronary arteries were become bony canals. Then I began a little to suspect. Soon afterward Mr. Paytherus met with a case. Previously to our examination of the body, I offered him a wager that we would find the coronary arteries ossified. This however proved not to be exactly true; but the coats of the arteries were hard, and a sort of cartilagenous canal was formed within the cavity of each artery, and there attached, so however to be separable as easily as the finger from a tight glove. We then concluded that malorganization was the cause of the disease. . . . The appearance in Mr. Bellamy's case gave me the idea that the disease arose from a determination of the vasa vasorum, and that the concretions were deposits from the coagulable lymph or other fluids, which had oozed on the internal surface of the artery.

The last two cases strongly suggest previous acute thrombotic coronary occlusion, in the first of which there was evidently a re-canalization of the artery.

Due to the fear of the effect it might have on his friend Hunter, Jenner did not further pursue his studies or publish these observations. They were subsequently confirmed by a postmortem examination on Hunter who died suddenly while arguing with colleagues at a hospital board meeting in 1793, some 15 years later. A necropsy was performed by Sir Everard Home, who wrote Jenner:

I am assured that you were sincerely afflicted at the death of your old and most valuable friend; whose death, although we all looked for it was more sudden than could have been imagined. It is singular that the circumstance you mentioned to me and you were always afraid to touch upon with Mr. Hunter should have been a particular part of his complaint, as the coronary arteries of the heart were considerably ossified.⁴

Among the other findings of interest in this necropsy were two white plaques, on the under surface of the

left auricle and ventricle, entirely distinct in color from the rest of the heart. These could well have been the results of former myocardial infarctions, possibly occurring at the outset of symptoms a score of years previously. The mitral valves and the aortic valves were extremely thickened, and in places ossified—probably the result of sclerotic processes, although suggestive of an old rheumatic infection. The aorta was dilated, giving the appearance of an incipient aneurysm. The internal membrane of the aorta was studded with opaque white spots raised higher than the general surface.⁸ These findings are consistent with those of syphilitic aortitis, and are consonant with the view that Hunter had syphilis, said to have been acquired during one of the operations on aneurysms, for which he was noted, or during some of the self-inoculation experiments with material from persons infected with venereal diseases. The changes in the coronary arteries were apparently of sclerotic origin, since these vessels were “hard as bony tubes.” Changes in the coronary arteries due to syphilis do not usually extend more than one to two centimeters from the orifices.

Jenner's views form the basis for the present-day concept of angina pectoris. The current teaching is that this condition is due to a relative myocardial ischemia occurring as a result of acute coronary arterial insufficiency. The mechanism of these attacks is still imperfectly understood. Nervous influences play an important rôle. In at least 75 per cent of cases, significant changes are found in the coronary arteries. Coronary arteriosclerosis is by far the most common lesion, although atresia of the orifices of these vessels as a result of extension of syphilitic aortitis, rheumatic coronary arteritis, emboli from various causes, and other less frequent factors are sometimes responsible. Angina pectoris

has been known to occur as a result of anemia, and cease when the anemia has been overcome. The opinion Jenner expressed concerning the progressive nature of the underlying changes was prognostically prophetic, for medical science still waits methods for preventing coronary artery disease or satisfactorily postponing its more serious consequences.

RHEUMATIC HEART DISEASE

About 1778, Jenner was instrumental in forming a society which had for its objective improvement in medical science. It was also intended to promote conviviality and good fellowship. This small medical society usually met in the Fleece Inn at Rodborough. Jenner was a member until about 1790. It was during these meetings that he presented a paper on angina pectoris, which later formed the basis of his friend Parry's book on that subject.¹

Edward Jenner was among the first to note the relationship between rheumatic fever and heart disease. According to the records of this society, on July 29, 1789:

“Mr. Edward Jenner favored the Society with remarks on a disease of the heart following Acute Rheumatism illustrated by Dissections.” This paper, together with the one on angina pectoris and others, fell into the hands of some of its members and he could never recover them. Baron, one of his earliest biographers, states:

I have heard him lament the loss of one of them in particular. It contained observations concerning the diseases of the heart, which frequently come on during attacks of acute rheumatism, and lead to enlargement and disorganization of the part. This formidable disorder had very much escaped the notice of medical men. Jenner's observations were original and had they been published at the time they were first communicated to the Society, his claim to priority could not have been set aside as it has been since that time by other writers.

On January 10, 1805, evidently wishing to establish claim to the originality of this observation, he wrote to Dr. Caleb Hillier Parry:

A neighbor of mine died yesterday, from a disease of the heart which followed two or three attacks of acute rheumatism. You may probably remember a paper of mine that was given at the Fleece Medical Society on this subject. This and my other papers are in your possession. If you could be good enough to convey them to me I should be extremely happy in regaining them particularly that I now allude to, as I am confident that many a life is lost by not shielding the heart at the going off of acute rheumatism. . . .

As there is no record of the return of this manuscript it seems evident that it was lost.

The claim for Jenner's priority in noting the relationship between rheumatic fever and heart disease is not as clear as that of the coronary basis of angina pectoris. According to Hope,¹⁰ David Pitcairn in 1788 taught that persons subject to rheumatism were attacked more frequently than others with an organic disease of the heart which he called rheumatism of the heart. Mathew Baillie¹¹ in a footnote in his second edition of *Morbid Anatomy of Some of the Most Important Parts of the Human Body*, published in 1797, gives Pitcairn credit for discovering the relationship between acute rheumatism and heart disease. In a later edition he states¹²:

Dr. Pitcairn observed this in several cases and should be considered as the first person who made this important observation. Its accuracy has since been confirmed by different individuals of high professional character, so that it may now be regarded as an established pathological fact.

These editions were dedicated to Pitcairn. In the first edition, published in 1793 and dedicated to Sir George Baker, no mention is made of this relationship.

Pitcairn, who incidentally was the son of Major John Pitcairn, who was

killed leading the British forces at the Battle of Bunker Hill, never published these observations. In at least one obituary notice he was given credit for being the first to associate acute rheumatism with heart disease. One states that he was the first to note the connection between rheumatism of the external parts and certain affections of the heart which he communicated to Dr. Baillie who wrote concerning it.¹³ Pitcairn was by nature a very shy person and once stated that the reason he never wrote was because he did not wish "to contradict seven years hence" his present opinion. One obituary writer commented concerning him "Such rigid abstinence from anything like authorship is not to be defended, particularly among the higher orders of physicians, because it may be extended to the rejection of every project for the improvement of their art."¹⁴

Although Baillie mentions acute rheumatism as a cause of morbid changes in the heart, it remained for Dundas, in about 1806, first to describe clinical cases of acute rheumatism with cardiac manifestations, proved later by postmortem examinations. These observations were published in 1812.¹⁵ He stated that as early as 1770 he had noted this relationship. Of the 9 cases he reported, 7 were dead and the 2 surviving cases offered poor prognoses. All of his patients were young individuals, only 2 over 22 years. In all the cases he had seen the disease followed one or more attacks of rheumatic fever. In 1 case the affection of the heart had appeared at the commencement of the acute rheumatism. Usually it attended a migrating polyarthritis and ran a course of a few months, ending in dropsy. In his description of the morbid anatomy, pericarditis and cardiac enlargement seemed to be the most prominent features, although in 1 case involvement of the mitral valve was inferred.

Irrespective of whether Edward Jenner was the first to note the relationship between acute rheumatism and heart disease, there is little doubt that he was among the first to conceive it. Jenner's and Pitcairn's observations were made independently. Jenner was at that time residing in Berkeley.¹⁶ Pitcairn lived in London. There is no evidence that they were then acquainted. Pitcairn was John Hunter's physician, and later they belonged to the same medical society in London. Although the manuscript was lost, there seems little question that Jenner was the first to write upon this subject. Since he supported his observations with necropsy specimens, which probably took some time to collect, it is not unreasonable to believe that he was the first to offer objective proof of the nature of rheumatic heart disease.

REFERENCES

1. Baron, John. *Life of Edward Jenner*, 1838.
2. Hale-White, Sir William. Jenner, Naturalist, Pathologist, and Country Doctor. *Brit. M. J.*, 1:204, 1923.
3. Garrison, Fielding H. *History of Medicine*, Ed. 4. Saunders, 1929.
4. Heberden, William. *Commentaries on the History and Cures of Discoses*. London, 1802.
5. Fothergill, John. Further Account of Angina Pectoris. *Medical Observations and Inquiries*. London, 5:252, 1776.
6. Parry, Caleb Hillier. *An Inquiry Into the Symptoms and Causes of the Syncope Anginosa Commonly Colled Angina Pectoris*, 1799.
7. Drewitt, F. Dawtrey. *Life of Edward Jenner*, Ed. 2. Longmans, Green, 1933.
8. Home, Everard, in a short account of Hunter's life, a prefix to a *Treatise on the Blood, Inflammation, and Gun-shot Wounds* by the late John Hunter, 1796.
9. Jacobs, Henry B. Edward Jenner, a student of Medicine, as illustrated in his letters. *Contributions to Medical and Biological Research*, dedicated to Sir William Osler, Vol. 11. Paul Hoeber, 1919.
10. Hope, James. *A Treatise on the Diseases of the Heart and Great Vessels*, 1839.
11. Baillie, Mathew. *The Morbid Anatomy of Some of the Most Important Parts of the Human Body*. Ed. 2, London, 1797.
12. *Ibid.* Ed. 5, London, 1818.
13. Obituary Notice (David Pitcairn) *Eclectic Repository*, 3:242, 1813 (Philadelphia). Reprinted from *London New Medical and Physiological Journal* of August, 1811.
14. Obituary Notice (David Pitcairn). *Edinburgh Med. & Surg. J.*, VI:126, 1810.
15. Dundas, David. On Account of a Peculiar Disease of the Heart. *Medico Chirurgical Transactions*, Vol. 1, 37, 1812.
16. Roddis, Louis H. *Edward Jenner and the Discovery of Smallpox Vaccination*. George Banta Publishing Co., 1930.

Survey of Belgian Health Services

IN coöperation with the Belgian Ministry of Health, the Health Committee of the League of Nations will make a survey of health conditions of the population and of the equipment,

organization, methods and efficiency of the health services in Belgium.

Professor Parisot, of Paris, is chairman of the committee appointed to make the study early this summer.

Alum Precipitated Toxoid for the Prevention of Diphtheria

ARCHIBALD S. DEAN, M.D., DR.P.H., F.A.P.H.A., AND
SAMUEL HYMAN, M.D.

*District Health Director; and Assistant District State Health
Officer, New York State Department of Health,
Buffalo, N. Y.*

THIS favorable field experience with one dose alum precipitated toxoid for the prevention of diphtheria is presented in view of the fact that the immunizing value of one injection of the product has been questioned. It is obviously desirable to produce immunity by one treatment, if possible.

In 1931, Glenny and Barr¹ described the complete precipitation of diphtheria toxoid by alum to produce a slowly absorbable antigen. In 1932, Wells, Graham, and Havens reported very favorable indications of immunity in guinea pigs and in children from the single injection of such an antigen.² Since August, 1935, alum precipitated toxoid has been widely distributed in upstate New York by means of the State Department of Health laboratory supply stations.

Seven months prior to such distribution an opportunity was presented for a trial of the product in Chautauqua County in the southwestern part of New York State. The Buffalo district staff of the State Department of Health assisted local health officials in the control of an epidemic of 17 cases of diphtheria with 3 deaths in rural Chautauqua County in December, 1934, and January, 1935. Twelve of the cases and all of the deaths occurred in 1935.

Chautauqua County, with an area of 1,069 square miles, had in 1930, 127,745 people, of whom 63,500, or 50 per cent, lived outside the two cities. The county, exclusive of the cities, has been relatively free from diphtheria. During the 10 year period 1925 to 1934, inclusive, the cases of diphtheria per 100,000 population in upstate New York urban areas of 2,500 population and over; rural areas of less than 2,500 population; and Chautauqua County, outside the cities were 40.3, 23.1, and 12.3, respectively. For the same period of time the death rates per 100,000 population for the above named areas were 3.1, 2.0, and 1.1, respectively. Following the epidemic, the rates in Chautauqua County, exclusive of the cities, again became relatively low. In the county outside the cities in 1935 there were 4 cases of diphtheria in addition to the 12 in the epidemic; in 1936 there was no case, and in 1937 there was 1 case, with no deaths. During 1936 and 1937 the cases per 100,000 population in upstate New York urban areas, rural areas, and Chautauqua County, exclusive of the cities, were 4.1, 4.4, and 1.5, respectively. The corresponding death rates were 0.4, 0.5, and 0. None of the Chautauqua County diphtheria occurred among persons who had received alum precipitated toxoid.

The diphtheria immunization status of rural Chautauqua County is indicated in part by the fact that a total of 1,316 or 28 per cent of the estimated population under 5 years of age, in the county outside the two cities on January 1, 1935, was officially reported to have had two doses of unmodified toxoid or three of toxin-antitoxin.

The intracutaneous test of susceptibility to diphtheria toxin was given in January and February, 1935, to 1,552 persons, with age recorded, in the epidemic area to determine whether or not they needed immunization. The Schick material which was used for the test in the left forearm and for the control of heated toxin in the right forearm was produced by the Division of Laboratories and Research of the New York State Department of Health. The arms were read after an interval of from 5 to 7 days. The age distribution of the 1,552 persons was as follows: under 5 years, 21 per cent; 5 to 14 years, 68 per cent; and 15 years and over, 11 per cent. Ninety-nine per cent of the children under 5 years of age; 70 per cent of those age 5 to 14 years; and 1 per cent of the persons age 15 years and over, who were Schick tested, had previously received unmodified toxoid or toxin-antitoxin.

Thirty-seven per cent of the 466 individuals tested who had never received toxoid or toxin-antitoxin were Schick negative, as were 85 per cent of 296 who had obtained two injections of unmodified toxoid 1 to 4 years previously, and 87 per cent of 790 who had received three treatments with toxin-antitoxin 1 to 10 years earlier.

Alum precipitated toxoid prepared by the Division of Laboratories and Research of the New York State Department of Health and meeting the standards of the National Institute of Health, was administered to 620 persons, of whom 442 were Schick posi-

tive and 178 had not been Schick tested. One dose of 1 c.c. of the material was injected subcutaneously on the outer side of each left upper arm. A nodule remained in the arm usually for weeks, but no undue reactions or abscesses were reported.

At 4, 16, and 28 months after the administration of the toxoid, Schick tests were given to as many as possible of the 620 persons who received the product. The procedure was the same as described for the preliminary intracutaneous test of susceptibility to diphtheria toxin. There were 401 individuals Schick tested at 4 months, 385 at 16 months, and 246 at 28 months. The dispersion of the population throughout 7 townships made repeated assemblage difficult. The persons who were Schick tested are considered to be random samples of the original 620 given precipitated toxoid, as each time all who could be induced to appear were tested.

It is probable that the small quantity of diphtheria toxin in the Schick material produced some immunizing effect. Among the 620 persons given alum precipitated toxoid there were 92 who received a total of four Schick tests, 211 who had three, 189 who had two, 95 who obtained one test, and 33 who had none. The 95 persons who had only one Schick test and the 33 who had none were the persons who failed to return for testing after they had had the precipitated toxoid.

Among 159 individuals who were Schick negative 4 months after having received 1 c.c. of alum precipitated toxoid, 152, or 96 per cent, remained negative 28 months after they obtained the toxoid. The percentage is nearly as high—94 per cent—among 69 persons who were known to be Schick positive prior to the receipt of the precipitated toxoid, and to have had no prior toxoid or toxin-antitoxin. Among 7 individuals Schick *positive* 4 months

Intracutaneous Tests of Susceptibility to Diphtheria for 620 Persons Each of Whom Received One Injection of 1 c.c. of Alum Precipitated Toxoid in January or February, 1935

TABLE I

Result of Schick Test at Intervals of 4, 16, and 28 Months After Administration of 1 c.c. of Alum Precipitated Toxoid to 302 Schick Positive Individuals Who Had Not Previously Received Toxoid or Toxin-antitoxin

Age in Years When Treated	Schick Test Subsequent to Administration of Alum Precipitated Toxoid									
	4 Months				16 Months				28 Months	
	Number Treated	Number Tested	Negative		Number Tested	Negative		Number Tested	Negative	
			No.	Per cent		No.	Per cent		No.	Per cent
0-4	17	14	12	86	10	9	90	10	10	100
5-9	94	59	55	93	61	57	93	48	45	94
Under 10	111	73	67	92	71	66	93	58	55	95
10-14	87	64	57	89	61	56	92	35	32	91
15+	94	62	47	76	52	37	71	17	11	65
Unknown	10	5	4	80	3	3	100	0	0	0
Total	302	204	175	86±1.6*	187	162	87±1.6*	110	98	89±2.0*

* = Probable error of the percentage

after receipt of 1 c.c. of alum precipitated toxoid, 5 were Schick negative 28 months after the injection of the toxoid. The group of 7 Schick positive at 4 months included 5 who were known to be Schick positive prior to injection of the precipitated toxoid and to have had no toxoid or toxin-antitoxin previously. Three of the latter 5 had negative Schick reactions 28 months after injection of the antigen.

The results of the intracutaneous

tests of susceptibility to diphtheria for 620 persons each of whom received one dose of alum precipitated toxoid are presented in 3 tables. Table I deals with the most significant group, namely, the 302 persons who were Schick positive before obtaining 1 c.c. of precipitated toxoid and had had no prior toxoid or toxin-antitoxin. At the end of 4 months from the receipt of the toxoid 175, or 86 per cent, of 204 of the individuals tested were Schick

TABLE II

Result of Schick Test at Intervals of 4, 16, and 28 Months After Administration of 1 c.c. of Alum Precipitated Toxoid to 140 Schick Positive Individuals Who Had Been Treated Previously, but Unsuccessfully, with Unmodified Toxoid or Toxin-antitoxin

Age in Years When Treated	Schick Test Subsequent to Administration of Alum Precipitated Toxoid									
	4 Months				16 Months				28 Months	
	Number Treated	Number Tested	Negative		Number Tested	Negative		Number Tested	Negative	
			No.	Per cent		No.	Per cent		No.	Per cent
0-4	1	0	0	0	0	0	0	0	0	0
5-9	30	16	13	81	18	16	89	14	14	100
Under 10	31	16	13	81	18	16	89	14	14	100
10-14	63	45	44	98	51	47	92	33	32	97
15+	41	32	30	94	18	16	89	11	11	100
Unknown	5	3	3	100	2	1	50	0	0	0
Total	140	96	90	94±1.6*	89	80	90±2.1*	58	57	98±1.4

* = Probable error of the percentage

negative; at the end of 16 months, 162, or 87 per cent, of 187 persons were Schick negative; and at the end of 28 months, 98, or 89 per cent, of 110 individuals were Schick negative. The results for the persons under 10 years of age were even more favorable, being 92 per cent of 73 persons at the end of 4 months, 93 per cent of 71 at the end of 16 months, and 95 per cent of 58 at the end of 28 months. The increasing immunity with time may be due partly to the late effects of the alum precipitated toxoid, to Schick test toxin, or to naturally acquired immunity.

Table II shows the effect of the alum precipitated toxoid which was given to 140 Schick positive persons who had been treated previously, but unsuccessfully, with unmodified toxoid or with toxin-antitoxin. For all ages, the percentages Schick negative at the end of 4 months, 16 months and 28 months after the use of the precipitated toxoid were 94, 90, and 98. The higher Schick negative percentages in Group II than in Group I may be due to the generally readier response to antigen of persons who have had previous antigenic stimulation than those who have not.

Table III indicates the result of the administration of alum precipitated toxoid to 178 individuals who had not previously been Schick tested and had not formerly received toxoid or toxin-antitoxin. For all ages, the percentages Schick negative 4 months, 16 months, and 28 months subsequent to receipt of the precipitated toxoid were 98, 98, and 95. It was anticipated that these percentages would be higher than those for Group I because many of the Group III individuals would doubtless have been found negative if they had been Schick tested before being given the precipitated toxoid. As stated previously, 37 per cent of 466 persons in the epidemic area who had never had toxoid or toxin-antitoxin were found Schick negative. If 37 per cent of the Group III individuals who were Schick tested at 4, 16, and 28 months were already negative before they received the toxoid, the percentages made negative by treatment would be 97, 97, and 92.

CONCLUSION

It has been demonstrated that even in an area where diphtheria is not endemic a single dose of 1 c.c. of alum precipitated toxoid will give immunity

TABLE III

Result of Schick Test at Intervals of 4, 16, and 28 Months After Administration of 1 c.c. of Alum Precipitated Toxoid to 178 Individuals Who Had Not Been Previously Schick Tested and Had Not Formerly Received Toxoid or Toxin-antitoxin

Age in Years When Treated	Schick Test Subsequent to Administration of Alum Precipitated Toxoid									
	4 Months				16 Months				28 Months	
	Number Treated	Number Tested	Negative		Number Tested	Negative		Number Tested	Negative	
			No.	Per cent		No.	Per cent		No.	Per cent
0-4	89	50	50	100	59	57	97	35	37	97
5-9	59	40	39	95	40	40	100	32	31	97
Under 10	148	90	89	97	99	97	98	67	68	97
10-14	25	9	9	100	9	9	100	3	3	100
15+	5	2	1	50	1	1	100	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0
Total	178	101	97	98±0.9*	100	100	98±0.6*	70	70	95±1.4*

* = Probable error of the percentage

to diphtheria, as determined by the Schick test, to approximately 89 per cent of persons for at least 28 months following injection. From the public health point of view the continued use of one dose alum precipitated toxoid seems justifiable.

REFERENCES

1. Glenny, A. T., and Barr, Mollic. The Precipitation of Diphtheria Toxoid by Potash Alum. *J. Path. & Bact.*, 34:131-138 (Mar.), 1931.

2. Wells, D. M., Graham, A. H., and Havens, L. C. Diphtheria Toxoid Precipitated with Alum—Its Preparation and Advantages. *A.J.P.H.*, 22, 6:648-650 (June), 1932.

ACKNOWLEDGMENT—The assistance of physicians and public health nurses in Chautauqua County and of W. M. Haenszel, statistician at the Buffalo office of the State Department of Health, who tabulated the data, is gratefully acknowledged.

Public Health Courses in Texas

A COURSE in public health has been offered during the past summer at the Texas Technological College at Lubbock, sponsored jointly by the Texas State Department of Health, the Industrial Division of the State Department of Education, and the College. The course is designed for the training of public health workers and sanitation officers. Successful completion of the course and subsequent examinations lead to a certificate of completion which will be recognized by the Texas State Department of Health. Courses have included Bacteriology, and its relation to Public Health, Dairy and Milk Inspection, Elementary Studies in Water Supplies and in Sewage Disposal, Elementary Surveying, Mechanical Drawing, Control of Swimming Pools,

and Public Speaking, and are given by the regular members of the college faculty, supplemented by lecture courses from visiting specialists. These supplemental lectures have included the Organization of Health Departments and Health Units, Personnel Qualifications, Housing and Slum Clearance, Dental Hygiene, Illumination, Industrial Hygiene, Rodent and Insect Control, Epidemiology, Vital Statistics, Food and Drug Inspection, Tourist Camp and Rural Sanitation. A total of 28 persons attended the school during the first sessions, with 16 completing the course. These individuals come from 21 counties distributed throughout the state. The members of the first class have formed the Texas Association of Trained Sanitarians.

Present Status of Safety Education in Some Representative School Systems

JOHN P. SULLIVAN, PH.D., F.A.P.H.A.

Supervisor of Health and Safety, Public Schools, Boston, Mass.

THE primary purpose of a questionnaire which we sent out was to lay the groundwork for a research study which would enable us to secure better guides for the formulation of a program of safety education for Boston. Through the medium of this questionnaire we endeavored to ascertain the status of safety education programs in other cities. In analyzing the returns particular attention was given to organization, supervision, policies, and procedures. From the data so gathered we attempted a comparison of safety education in these cities with the program existing in Boston. The aim was to bring out any omissions in our own safety program. The study further intended to embody the best in policies and organization from other cities, and to determine the extent to which certain experimental procedures were used.

PROCEDURE

In order that the questionnaire might be adequate for the purpose for which it was intended, it was submitted to a superintendent, a director of educational research, a supervisor of safety education, a headmaster, and a classroom teacher for their approval. Their suggestions were incorporated into the following form which was adopted.

This form was sent to 100 representative school systems scattered through the country with a conscious con-

sideration of large and small city school systems of reputed progress in education. Despite the fact that this questionnaire required detailed information from the recipients it was favorably received and the authorities of 75 of those 100 school systems approached gave information which was complete enough to be of value.

Since the average school superintendent has been literally bombarded with blanks, forms, and questionnaires in the past 15 years it was felt that this generous response indicated a definite interest, if not enthusiasm, concerning this newer movement of safety education.

In order to consider the replies to the questionnaire on a geographic basis, the country was divided into 4 sections. Here it was found that 29 per cent of the replies came from school systems in the South; 17 per cent from the West; 28 per cent from the Northeast, while 26 per cent were from the North Central section. These replies furnished an excellent cross-section of American school systems.

In order to facilitate classifications, the data compiled from the replies were grouped in the following order: Organization, Supervision, Policies and Procedures. Under organization fell questions 1, 3, 4, 10, 11, 12, 13, 18; under supervision question 2; under policies were included questions 5, 14,

THE SCHOOL COMMITTEE OF THE CITY OF
BOSTON, ADMINISTRATION BUILDING,
15 BEACON STREET

OFFICE OF THE SUPERINTENDENT

To the Superintendent of Public Schools:

The Boston School Department is very much interested in Safety Education. We ask your coöperation in giving us the following information in regard to your school system by checking the items listed.

Name of City State

Name of Person Replying

Position of Person Replying

- | | (Check) | Yes | No |
|--|---------|------|------|
| 1. Have you a course of study in Safety instruction? | | | |
| 2. Have you a person assigned to supervise Safety? | | | |
| 3. Is Safety instruction given a definite time allotment in the school curriculum? | | | |
| 4. Is Safety instruction given as part of Health instruction? | | | |
| 5. Is Safety Education compulsory? | | | |
| (a) State Law: | | | |
| (b) Local School regulation: | | | |
| 6. Do you have police assigned for school Safety work? | | | |
| (a) Full time: | | | |
| (b) Part time: | | | |
| 7. Do you have accident data distributed to teachers? | | | |
| (a) By appointed School Official: | | | |
| (b) By Police Department: | | | |
| (c) By Private Agency: | | | |
| 8. Do you have Auto Clubs in Senior High Schools | | | |
| 9. Do you have student Safety Councils or clubs? | | | |
| 10. Do you have Safety Patrols? | | | |
| (a) Elementary: | | | |
| (b) Junior High: | | | |
| (c) Senior High: | | | |

- | | | |
|---|------|------|
| 11. Do Safety Patrols direct vehicular traffic? | .... | .... |
| (a) In Street: | .... | .... |
| (b) From Curbing: | .... | .... |
| 12. Do you have Safety Patrols supervised? | .... | .... |
| (a) Local Police Department: | .... | .... |
| (b) Local School Department: | .... | .... |
| (c) Private Agency: | .... | .... |
| 13. Do Safety Patrols wear some insignia— | .... | .... |
| 14. Do you permit commercial Safety material to be used in the classroom? | .... | .... |
| (a) Teachers' use: | .... | .... |
| (b) Pupils' use: | .... | .... |
| 15. Do you have Police protection at dismissal times? | .... | .... |
| (a) Elementary Schools: | .... | .... |
| (b) Junior High Schools: | .... | .... |
| (c) Senior High Schools: | .... | .... |
| 16. Do pupils receive instruction in all schools regarding: | | |
| (a) Crossing streets at intersections: | .... | .... |
| (b) Playing in the streets: | .... | .... |
| (c) Traffic regulations and signals? | .... | .... |
| 17. Are the primary children cautioned about Safety before each dismissal? | .... | .... |
| 18. Do you have a system of collecting and investigating reports of school accidents? | .... | .... |

Any additional information that you may be able to give us regarding Safety Education such as, monographs, bulletins, reports, types of visual material and courses of study will be greatly appreciated, and any suggestions growing out of your experience will be welcomed.

In requesting this information we realize the encroachment on your time and courtesy, and we shall be very glad to forward the completed study.

Very truly yours,
JOHN P. SULLIVAN
Supervisor of Health & Safety

16, 17; while under procedures were treated the remainder, 6, 7, 8, 9, and 15.

ORGANIZATION PROBLEMS

The problem of organizing safety education varied, but there were strong

indications that the importance of this problem was recognized and that attempts were being made to meet it.

Course of Study in Safety Instructions—In compiling the replies received from the 75 cities in answer to the ques-

tion "Have you a Course of Study?" it was found that 89 per cent of the school systems had either an individual safety education course of study or one which was an integral part of their health education program. It was further found that 51 per cent had a unified independent safety education course.

These figures indicate the growing recognition of the place of safety in the curriculum; yet there seems to be a fairly large percentage whose safety courses are of a tentative nature, suggesting that this phase of education needs more consideration in some sections. From the data submitted and from a further study it would appear that the elementary safety courses for grades 1 to 6 are well advanced; that those for the junior high school (grades 7 to 9) are in the developing stage; and that very little has been done in the senior high school field.

If the final test of learning is the emergence of appropriate conduct, then the teacher of upper as well as lower grades should have some outlines of the general attitudes, the finer appreciations, the important concepts and meanings, which they wish to secure as part of the results of the safety program.

Not until such time as there is a course of study scientifically constructed for all grades can we expect a unified, graded, and progressive plan of instruction and training in safety. School administrators must face the fact that if they give guidance to teachers in all phases of the curriculum except safety, it will undoubtedly occupy a correspondingly minor position in the minds of the pupils as well as the teaching force. Teachers are entitled to as much guidance in safety teaching as in the teaching of other subjects. If safety teaching and training are among the objectives of education, then the course of study is an important vehicle.

Time Allotment—In studying the

problem of time allotment for safety education the widest diversity was noticed—only 36 per cent of the cities answering recording a definite time allotment for the study of safety.

From the additional information sent by many cities it may be said that the majority of school systems in the country are at present combining the study of safety with other subjects in the program. However, many are now planning a course of study with the intention of including it in the curriculum with a definite time allotment. This is an interesting highlight in view of the statement often heard that no more time can be given for new work. It shows definitely that school administrators have given and are giving this new movement careful consideration and feel that it is worthy of a definite time allotment in the development of their curriculum.

Safety, a Part of Health—That safety is an important factor in the conservation of child life cannot be denied. Reputable tabulations have statistically proved that accidents are responsible for more deaths than any single disease of childhood and, limiting ourselves to children of school age, *i.e.*, 5 to 15 years of age, accidents are responsible for 1 out of every 5 deaths. Quoting from Dr. Herbert Stack, we find our justification for those cities which have made safety a part of their health or physical education program:

No one will question the fact that safety education has an important place in the school curriculum today. Educators generally agree that health and safety are basic objectives in the elementary and secondary schools; for of what avail is it to have a youngster learn the fundamental truths and the subjects of the school if he loses his health or even his life, or is seriously injured in childhood?

In view of the above quoted statement, we find that the cities answering from the various geographical divisions must have adopted this attitude. In

stating that these cities combine safety education with either health or physical education, we do not intend to convey the impression that the treatment of this subject is stereotyped to any degree; rather, it seems as if the presentation of the subject varies with the cities and their teaching staff.

Reports on School Accidents—We found that the collection and investigation of reports on school accidents has become a highly systematized part of the safety program in 60 per cent of the cities. Although this procedure was mentioned in two-thirds of the cities answering, it is doubtful whether any 5 cities returning answers go about the cataloguing of the returns in the same manner.

It was interesting to note that those cities which listed a collecting and investigating accident unit as an integral part of their safety program were among the largest cities in the country.

Safety Patrols—The safety patrol is the most universal phase of the safety program carried on in the school systems of the country. In compiling the returns it was found that of the 75 cities contacted, 89 per cent were affirmative in their reply to the question "Are Safety Patrols in Use?"

The value of school safety patrols is everywhere recognized by authorities and prominent educators. In fact, through the medium of a congressional committee this movement was given national recognition by means of an unqualified endorsement. When President Roosevelt, in May, 1936, addressed the school safety patrols convention held at Washington, D. C., he stated:

The future belongs to youth, and when youth voluntarily assumes helpful activities like yours, for the benefit of the entire community, I, for one, feel ever so much more confident in regard to the future.

There are many benefits which have been derived from these patrols. The

first benefit, of course, is the protection of the pupils. Moreover, the effect of the patrols on the character development of the pupil is an important factor. Many cities have found that these patrols stimulate the backward boys. One western city has included in the patrols boys who have been "problem children" to the police. This has proved to be an excellent idea in this city as these boys have developed the spirit of good citizenship and have ceased to be troublesome. The majority of the cities, however, require very high standards in both character and scholarship for membership in the patrols.

It has been found that knowing the theory of a subject is not always the knowing of the application of the theory. Therefore teaching safety through the patrols is teaching and practice of a theory.

Schools Having Safety Patrols—In studying the disbursement of safety patrols in the various school systems our study showed that 83 per cent of the 75 cities answering had safety patrols in the elementary schools, 71 per cent in the junior high schools, and 41 per cent in the senior high schools.

From the above it may be safely concluded that the majority of cities have found the patrols a necessity in the elementary schools, desirable to the well-being of the pupils in junior high school, and helpful to the senior high schools.

Supervision of Patrols—The patrols of the country are all organized on somewhat the same plan. They are, however, supervised in various ways.

It is impossible to give an accurate estimate of those cities using the assistance of the police, school department, and private agencies in the supervision of their safety patrols as 17 per cent of the cities were unable themselves to answer the question on supervision. This may be due to the fact that many of the

patrols are not under the immediate supervision of the board of education, but are handled by the principals of the individual districts or schools. It is also noticeable that the majority of the safety patrols in the cities are supervised by their local school departments while many of the patrols are directed by the local police department, and a very small percentage by private agencies. Some cities find it beneficial to have the police department assist the schools in their patrol work, while other cities have their school departments handle the entire patrol program.

Duties of Patrols—The duties of the patrols of the cities are uniform in that their purpose is the protection of the pupils while en route to and from school. Some cities also favor a patrol within the school and on recreation grounds. A large number of cities have a cadet or monitor system in the school buildings.

The duties in the directing of the vehicular traffic among the cities vary. The majority of the cities which state they do not allow the directing of vehicular traffic by members of the patrol, do not object to the patrol member raising his hand to warn motorists approaching a group of children who are crossing the street if he remains on the curb. They do not consider that this motion is directing or controlling the motorist, but merely calling his attention to his obligation under the law to respect the rights and safety of pedestrians at crosswalks.

It is shown that 31 per cent of the cities permit their patrols to direct traffic from the curb. This is found by many of the cities to be the most desirable way in which to assure a safe crossing for the children.

Of the cities having safety patrols, 25 per cent allow patrol members to control vehicular traffic in the street. This is a fairly large per cent in view of the fact that this is gen-

erally thought to be a poor practice.

Insignias—Of those in cities having safety patrols, 83 per cent wear insignias. The majority wear the Sam Brown belts while some wear arm bands signifying their membership in the patrol.

The use of whistles, flags, sticks, and stop signs by the cities varies. A majority of the cities absolutely forbid the use of any object in the hand, while a few allow their use to aid in patrol work.

In some instances private organizations supply the school patrols with slickers, rain capes or water-proof ponchos, and hats. One northeastern city believes that these ponchos and hats are an absolute necessity to the patrol boys on stormy days as accidents are much more likely to happen during stormy weather when visibility is low.

Conclusion on Safety Patrols—From the statistics gathered it may be said that the safety patrols are of the utmost importance. They have been tested and proved to be a decided benefit; first, to the community, in the saving of thousands of lives; second, to the youth, in character development; and third, in the training of youth in safety, so that the future, of which they shall be a part, will be years of security with freedom from the hazardous conditions existing today.

SUPERVISION

The policies pursued by the cities sending replies regarding the supervision of safety education varied. The statistical compilations show that of all the cities included in this survey, 47 per cent have their safety program supervised.

It has been the contention of prominent educators throughout the country that safety education supervision is vital to the complete fulfillment of the program. Dr. Herbert J. Stack of Columbia University pro-

posed the question, "Who shall direct the safety education of the public schools? Shall it be the Police Department, the local Safety Council, the Board of Public Utilities, the various chambers of commerce or other civic agencies?" Dr. Stack stated that his personal belief was that the direction and control of school safety activities in their entirety should be within the hands of the independent school administrations. Of course, the assistance of other agencies is acceptable, but the responsibility for the organization of the curriculum and the supervisory activities should be entirely in the hands of the superintendents and directors. He further stated that the best safety programs were those organized in cities where the superintendent designated the director of health or physical education as supervisor of safety. Justifying this statement he said:

For without the coördination that this department can help provide through its trained teachers, the safety program is likely to suffer. No program can be effective unless it is well organized with responsible teachers to carry it out.

Further additional information as it was compiled revealed much data on safety education programs and their supervision in the American school system that was interesting and worth while. However, the variety of practices discovered leads to the conclusion that more uniformity is necessary for permanent gain along these lines.

It should not be a part of this new program to call into being additions which would still further bear down upon a civic unit already so costly as the school system, rather, it should be through the changing of educational attitude and the coördination and utilization of already existing agencies that the school safety work should be made more effective.

POLICIES

The policies pursued in all cities sending replies proved interesting and enlightening. It is quite evident that the outstanding need is a philosophy of safety education. With the accepted principles from such a philosophy the movement would have a guide to steer it through its youthful stage of development. Activities, content, and devices would then be tested by approved standards, and not alone by the trial-and-error method. This problem presents another possibility for some research worker to contribute to the safety education movement.

Safety Education Compulsory—Statistical compilations show that 49 per cent of the cities in the study have safety education as a requirement either by state law or local regulations, with approximately 13 per cent having a compulsory feature in both state law and local school regulations. On the other hand, 29 per cent have only a local compulsory requirement, while 7 per cent work only under the required state law.

In answering the questionnaire, some of the cities stated that although they have no compulsory requirement in either the state law or local school regulation regarding the teaching of safety, they do encourage instruction in safety and have it given in their schools.

Our study showed that nearly half the cities contacted considered safety education absolutely essential to the welfare of the pupil. This fact is emphasized by the compulsory feature in both state and local regulation. This per cent may even be considered greater as many cities not reporting a compulsory requirement included the study of safety in their curriculum.

Use of Commercial Safety Material—Statistics showed that 65 per cent of the cities authorized the use of commercial material in the classroom. How-

ever, only one of the 75 cities permitted this material to be given to the pupils to aid them in their study of safety. In 32 per cent it was the right of the teacher alone to use commercial material while both the teacher and pupil are permitted to use commercial material in another 32 per cent of the cities.

The policies of the cities varied regarding the use of commercial material. One New England city will allow the use of commercial material only if it does not "savor of advertising," while another school system authorizes the use of American Automobile Association and National Safety Council material as these groups are "non-dividend paying organizations." One school system in the north central section permits the use of commercial material only after it has been approved by the board of education. A southern city uses all commercial material with the name of the company deleted while a western city issues to its principals and teachers each month a "safety kit" which contains various booklets, pamphlets, and posters on highway safety.

In answering this question many cities answered in the affirmative with the restriction that the material must not be of an advertising nature. It may be said, therefore, that the majority of cities do use commercial material which is of value in the safety education field, but which does not advertise a product.

Special Safety Instruction—It was found on studying the compiled returns that instructions on crossing streets, playing in streets, traffic and signal regulations were given in 87 per cent of the cities in this survey. The majority gave instructions in the schools on all these subjects, while some gave instructions in just crossing streets and playing in streets, while a

few conducted a course in only traffic and signal regulations.

These figures show that the majority of the school systems realize the importance of these three phases of safety education and include them as special topics in safety.

Primary Children Cautioned at Each Dismissal—From the statistics gathered it was found that 54 per cent of the 75 cities made it a practice to caution their primary children before each dismissal.

It is interesting to note that while some cities believe the younger children should be cautioned at each dismissal, others do not think it necessary because a well organized safety program with a definite time allotment is included in their curriculum.

PROCEDURE

The procedures used throughout were fairly uniform. But here again the schools should be guided by research and a sound philosophy.

Police Assigned for School Safety Work—It was found that police were assigned to school safety work in 77 per cent of the 75 cities contacted. A full-time schedule was listed in 28 per cent and part-time in 49 per cent.

The facilities of the police department are utilized by many of the cities in various ways. Those not assisted by the police in their safety talks and demonstrations receive the coöperation of the police in the safety patrol work and in the direction of school dismissal traffic.

The work of the police department coöperating with the school department is many-fold in its benefits. The police department can render invaluable assistance to safety education through their years of experience, by their badge of authority—not in the sense of coercion, but in the sense of prestige—and by the special training in safety work that many of these

officers receive. The statistics quoted show that the police departments are a recognized asset in aiding in the cause of school safety work.

Police Protection at Dismissal Time—Police protection of the school children at dismissal time was found to exist in 82 per cent of the cities. Of this percentage the majority stated that protection was given only at dangerous crossings. The elementary, junior high, and senior high schools have police on duty at dismissal time in 49 per cent of the cities, while 12 per cent had it just for the elementary and junior high schools; and 20 per cent had it for their elementary schools.

This study might well raise the question as to how any city can get along without police protection at dismissal time. For instance, one city reports no such protection since the formation of student patrols. It may be too that many cities not reporting here have well organized patrol systems and may not deem it necessary to request police assistance to supervise school dismissals.

Accident data distributed to teachers—Our study revealed that in the school systems of 68 per cent of the cities studied, accident data were distributed to teachers. The school department furnished records of all school accidents; the police department of all city accidents; and private agencies of accidents of all descriptions. Approximately 12 per cent of the cities collected accident information from all available sources; that is, school records, home accidents, police records, and records of private agencies; while school officials with the aid of the police department furnished data in 5 per cent of the cities. Private agencies assisted the school officials in distributing accident information in 6 per cent of the cities, while police accident data, only, are distributed in 6 per cent of the cities' school systems; private agencies

furnish all accident information in 8 per cent of the cities. Approximately 28 per cent of the cities send to their teachers only accident material regarding school accidents furnished by the school officials.

From the comments made on the questionnaire and from additional information it is noticeable that many of the cities which use only school accident data tell us that they do, however, use material furnished by the different state or city departments, such as the department of public safety and the state highway department.

Auto Clubs in Senior High Schools—Auto clubs in senior high schools were organized in 43 per cent of the cities contacted. An extensive course in safe driving was found to be given in nearly all schools that have auto clubs. Some cities do not have clubs but do include driving courses in the curriculum.

Therefore, it would seem that auto clubs in senior high schools would be of great value inasmuch as these pupils are the future operators of vehicles and a training in the proper way to handle a car would reduce the accident rate in the years to come.

Student Safety Councils or Clubs—Of the 75 cities, it was found that 69 per cent conducted student safety councils or clubs in their school systems, and of these 16 per cent stated that they had safety councils but only in scattered schools.

Through these councils the student is given the opportunity to see and solve problems that occur in his daily life. The working out of actual problems through organized activities makes the student keener and more alert to existing conditions.

Organizations—From the additional information sent to us, it was found that the majority of cities with well organized safety councils have as their main objective the prevention of accidents by the removal of the causes. The first

step taken toward this goal was the formulation of a set of "Safety Laws" to govern the conduct of students. The administration of these laws is then taken into consideration. The following procedure is used by many of the cities:

1. The objectives of the Safety Council are presented at a meeting of the faculty.
2. A faculty representative is appointed.
3. The objectives of the Council are presented at a meeting of the student body.
4. Representatives are elected from each home-room (usually two).
5. The representatives meet with the faculty member for discussion of objectives and the duties of committees.
6. A meeting of the representatives is held for the election of officers and the drawing up and adoption of a constitution.
7. A meeting of the representatives is again held for the purpose of putting the constitution into effect and to appoint committees and to explain the specific duties of each committee to its members.

These elected representatives are active members of the council and other students are called associate members. The purpose of this is to stimulate interest and to unite the entire school in a common cause.

Duties—The duties of the council are many. The committees appointed make studies of the different types of activities and observe traffic conditions in the hallways and on the stairways and at dismissals. The reports are given to the faculty representative who takes them under advisement. If the recommendations are accepted an attempt is made to adjust the situation.

It has been found by some cities that the best results are obtained when the clubs are organized by schools and not individual grades. A club organized and controlled by the pupils themselves under supervision was found to produce the best results, and the cities having the councils are very enthusiastic about the results which they have obtained.

RESULTS

The rapid growth of safety education in the school systems of the United States is apparent. Not one city included in this survey shows a total lack of interest in safety education, whether of a formal or informal nature. It is noticeable that where the percentage is low in either separate or combined courses of study in safety, the percentage is high for activities such as councils, safety patrols, and auto clubs.

A separate course of study is being used in 51 per cent of the cities. Although 38 per cent state that they have no separate course of study in safety instruction, they do include safety in their health education program. Therefore, it may be safely said that 89 per cent are interested in safety instruction.

It was further shown that safety education is favored when approximately one-half of the cities reported safety education compulsory either by state law or local regulation.

A person was assigned to supervise safety programs in 47 per cent of the cities. The title of the person in charge varied in some instances. In one he was known as the Safety Engineer; in another he was called the Director of Safety; one listed a Director of Physical Education and Safety; but the majority were listed as Directors of Health and Safety Education.

A definite time allotment for the study of safety was given in only 36 per cent of the cities. It is interesting to note that a majority of the 51 per cent reporting a definite course of study assigned definite time allotment in their curriculum for safety instruction.

A vast majority have organized safety patrols which are conducted in the elementary, junior high and senior high schools. The patrols are supervised for the most part by the school

departments and police departments; a few cities being assisted by private agencies. Simple insignias are used by the safety patrols in the majority of these.

It is also noticeable that many of the school departments of the cities which have a system of collecting and investigating school accidents also distribute to their teachers data of accidents occurring outside of schools.

The use of commercial safety material in the classrooms of the schools varies, the majority of the cities allowing its use but with restrictions.

Special instruction in crossing streets at intersections, playing in the streets, traffic and signal regulations, is given in most of the cities, with only a very small percentage feeling that this instruction is not necessary.

A little more than half of the cities concerned, it was found, cautioned their

primary school children at the end of each session, while the remainder relied on the police protection at dismissal time.

Safety councils, auto clubs, school patrols and other activities are carried on by many cities. In 35 per cent all three types of activities are encouraged. It is interesting to note that some that do not have safety patrols have safety councils or clubs.

The police have contributed their services to most of the cities' safety programs. Some have them part time, and others full time.

These facts on safety reveal that the school authorities of the country are mindful that the preservation of life is an obligation and duty which they must meet and discharge to the best of their ability. It has been shown through the returns by the 75 cities just how this obligation has been met.

Sioux Sanatorium Opened

THE Sioux Sanatorium was recently completed at Rapid City, S. C. This \$272,000 government institution for the Sioux Indians was formerly the site of an Indian school.

Arthur Joseph Wheeler, M.D., superintendent of the Albuquerque Indian Sanatorium of Albuquerque, has been appointed superintendent of the new sanatorium.

Registration and Approval of Public Health Laboratories as Carried on in Connecticut*

FRIEND LEE MICKLE, Sc.D., F.A.P.H.A.

Director of Laboratories, Connecticut State Department of Health, Hartford, Conn.

WITH so many public health activities resting upon the groundwork of laboratory findings there exists a need for official control over laboratories where daily are carried on examinations of body fluids and excretions, bacteriological or chemical analyses of milk, frozen desserts and milk products, or tests of water or sewage. Unfortunately, it is not difficult to call to mind public health laboratories where the quality of work carried on might be improved by the right kind of guidance. It may be profitable to review briefly some procedures and standards under which the quality of work in laboratories has been improved through supervision. Any suggestions presented will be offered with a full realization that conditions vary widely in different localities. It is a safe assumption that a set of procedures followed with some measure of success in one state could not possibly be successful in another without special adaptation to the new locale. The principles are applicable to all sections of the country.

Without general oversight from some official control agency there is no ques-

tion that results will at times come forth from public health laboratories that may not only cause real annoyance to individuals concerned but that may seriously interfere with progress in public health, mar the good work of the physician and the health officer, and surely exert an adverse effect upon the health of the citizen if not, in the extreme instance, cut short his life. Where is the public health official who has not experienced embarrassment in attempting to explain conflicting laboratory findings on similar specimens examined in different laboratories! It is illuminating that in Connecticut the annoyances and losses of money caused to the milk industry by the analyses and interpretations from unsupervised laboratories—private and public—became so serious two decades ago that the industry itself, independent of the state control agencies, sponsored the passage of legislation that since then has required approval of dairy laboratories and the licensing of all personnel.

There are several reasons for unreliable reports from laboratories. The shyster who deliberately falsifies his findings for the benefit of his client has seemed to be much more of a rarity, even in the state that has won the sobriquet of "the Nutmeg State," than

* Read before the Laboratory Section of the Massachusetts Public Health Association at the Annual Meeting, Boston, Mass., January 27, 1938.

might be expected. Far more frequently encountered is the well intentioned person with a partial lack of training and experience who considers himself capable of making, and reporting to the public, examinations for infectious agents in body fluids, tests on dairy products, analyses of water or sewage, or other laboratory determinations. Too often even the college graduate with very little training in bacteriology, chemistry, or public health, and sometimes with no real experience, will attempt to carry on laboratory work and make interpretations of findings that would not be attempted by the expert with years of practice to his credit. The failure to use proper apparatus and the improper use of even the best of equipment are frequent causes of unreliable results. Dependence upon obsolete technics and methods not generally accepted may lead to troublesome findings. Many of the causes of unreliable reports may be favorably influenced by supervision.

Early in this discussion it should be emphasized that official supervision is not *per se* a panacea for all the ills of unsatisfactory laboratories. To be effective a system of control must be carefully planned and efficiently carried on. By themselves, authority and inspection will never produce some dreamed-of utopia. The best trained laboratory expert, whether supervised or not, has to be constantly on guard against the many pitfalls that beset the laboratory worker who tries to do a perfect job. No one can do a perfect job all of the time. At times even the well trained laboratory worker may become careless. Usually the person who performs laboratory tests inaccurately or who makes misleading interpretations from his findings is a reasonably honest individual striving to the best of his ability to earn a living by putting to use what training he has been able to secure. All too often the

partially trained laboratory worker succumbs to the temptation to make tests for which his experience or educational background is inadequate. There still can be found poor laboratories in those states where approval is in force, and the well trained laboratory worker will occasionally make errors no matter how closely supervised. But these are the exceptions which emphasize the rule.

To bring about improvement under the conditions existing generally in public health laboratories, supervision must have as handmaidens education and coöperative effort. The supervising official who would be successful in improving quality of work must bring to his task interest in his work and a spirit of coöperation toward those with whom he works, and he must to a considerable extent be an educator and a tutor. Regardless of the authority he represents, he must be friend, fellow worker, teacher, and diplomat far more than he is inspector. Successfully to do these things he must be a trained and experienced public health laboratory man connected with some organization officially recognized for the enforcement of health legislation. It is not without reason that the state department of health has almost universally throughout the country been the repository for laboratory supervision. It is essential that in the approving of public health laboratories the state work in coöperation with the local health officer or local health department. The state health department has, or should have, an organization already perfected for dealing with local health interests. Neither in some other state control group nor in an organization national in scope can it be hoped to develop the flexibility necessary for adapting approval to local health conditions so easily or so well as it can be built up in the already functioning state health department.

With trained and experienced laboratory experts on its staff, with consultants always available on the epidemiological aspects and the water and milk and other problems, and particularly with a public health council or board already constituted for keeping regulations and rules within proper bounds, the health department appears to be the logically supervisory agency.

It is not that an officially designated body will be enabled to improve the quality of work in local laboratories by some magic show of policing authority. Rather will results be accomplished by restraint in the use of a potential power held in reserve for the very occasional instance where coercion is needed. The power to revoke approval that has been extended furnishes a handy correctional weapon and provides opportunity to make thorough investigation in the infrequent instance when it is necessary, but it is rather through educational effort and coöperation extended to local laboratories over long periods of time that in a manner not at all magical the quality of the work can be made to improve in both the good and the mediocre laboratory while the bad laboratory may solve its difficulties by passing out of existence. Through supervision, methods and procedures in widely separated laboratories may be unified, and research and incentive stimulated. Slow moving constructive effort will do what magic cannot accomplish.

GENERAL OR SPECIFIC APPROVAL

Laboratory approval may be a sort of blanket approval extended to a laboratory after inspection of the equipment and investigation of the qualifications of the personnel or the person in charge to cover any and all work that may be done. On the other hand, it is entirely feasible to limit approval to a specific list of tests and to insist that the results of no examination not

on the list be used or published until approval has been extended to cover that test. Blanket approval is beset with difficulties chiefly because the person in charge of a laboratory may be capable of making certain tests and yet be incapable of making or interpreting the results of some other determination. For example, many well trained chemists may not have the background of training to make and interpret properly rather simple bacteriological tests. Limited approval for specific lines of work is more generally in vogue and more to be recommended than is unqualified approval.

LAWS AND REGULATIONS

Prerequisites for official control of laboratory work, in whatever field, are law and regulation. A law may be either simple or involved. An example of the former is a statute requiring merely that any laboratory making specified examinations be either registered with or approved by the official control agency. A law requiring approval of every laboratory if it is to exist may work hardships upon an individual or a corporation, and a law providing alone for registration is not to be recommended; but when compulsory registration of all public health laboratories is combined with provision for approval of those laboratories meeting specified standards for high-grade work then registration becomes merely a sort of notice to the state and its citizens that a laboratory is being conducted at a stated location, while those laboratories meeting established standards enjoy the benefits that accompany official sanction. Under such legislative enactment no great amount of control is exerted over the registered laboratory—at least until the quality of work in a specific instance is so poor as to occasion serious complaint demanding investigation—but there is established a complete directory of laboratories

carrying on every phase of health work. Supervision is exercised only over the laboratory that has applied for and received approval. The public becomes educated to demand the services of the laboratory that can qualify under the law. Although the poor laboratory may become labelled as such by inference it is not legislated out of existence.

Under most circumstances it is desirable to have the law as simple and brief as is consistent with rather broad powers, and preferably to have it provide full authority for the approving agency to promulgate rules, requirements, and standards upon which approval shall be based. Power of revocation of approval for cause should be provided in the law, and the approving agency should be given full powers to make check tests or investigations desirable to determine at any time the accuracy of methods followed or the ability of the person in charge to report on or interpret any particular test. General provisions for enforcing the law in Connecticut are in the form of sanitary code regulations; departmental rules provide detailed procedures. With provisions made for enactment of a code and promulgation of regulations, the law itself may be concise yet comprehensive.

All types of public health laboratories should under the law be required to register, including those in city departments of health, in educational institutions, in hospitals, in milk plants, and those laboratories operated commercially or privately for profit. If registration of all laboratories is not required, the law may later be found to contain embarrassing loopholes. Experience has not revealed objection on the part of old established educational institutions and hospitals to register annually, and most apply for approval because usually there is no difficulty in meeting the requirements. This tends to strengthen and give broad scope to

the activity and helps to maintain high standards.

The limiting of approval to apply only to those tests where the results will be published or "used" for the purposes of diagnosis of communicable disease or release from quarantine or as the basis of an opinion of sanitary quality or one that involves the public health, has been found to have advantages. Under a law into which that provision is embodied a laboratory operated by a milk plant for the examination of samples of the firm's own product and of producers' supplies would be exempted from approval. Thus the law would not intrude into the private business of an individual or a firm. The laboratory technician at a milk plant might even become interested in testing the products of competitors and could legally do so under this type of law without applying for approval unless the results were published or some of them "used" by salesmen or in some other way such that the sales or interests of competitors might be affected or unless the products of the firm were advertised on the basis of the findings obtained. Should the results be used in such fashion it is evident the requirement of approval should apply. The situation is similar in respect to the water or sewage laboratory or regarding the physician who examines specimens in his own practice or the private sanitarium or institution making certain routine cultures or examinations of smeared preparations collected from patients remaining more or less permanently in the institution.

HOUSING AND QUARTERS

It is rather universally considered that adequate housing for the laboratory should be made a prerequisite for approval. Reasonably reliable examinations even of a bacteriological character can be carried on in fairly crude

quarters if the rooms are decently clean. For that reason standards for housing should not be set too high. Yet in this day and age it is certainly not going too far to require clean, comfortable, fairly commodious, and well lighted working quarters without involving undue expense. Regulations should be sufficiently flexible to allow the common sense and good judgment of the approving official a reasonably wide range of play. Requirements should be designed to encourage improvement in the housing of laboratories.

EQUIPMENT AND SUPPLIES

In a system for the control of laboratories provision should be made for requiring the use of standard equipment. It may be sufficient merely to require that apparatus be complete and in good order at all times as considered necessary for making each determination, examination, or analysis according to the method which the person in charge has agreed to follow. Such a requirement allows the control official enough leeway to meet special situations and yet gives him the necessary authority for insisting that standard supplies be used. Inspection should be provided to determine at reasonable intervals that the several kinds of apparatus in use are maintained adequate for any increasing volume or changing lines of work and that all equipment is kept clean and in good condition. It is surprising how far afield in using broken and worn-out equipment well trained laboratory technicians—and for that matter even directors of laboratories—will allow themselves to go where there is no supervision. Regardless of your or my opinion of the value of a particular laboratory test we would be agreed that the test had better be left undone than to be poorly or indifferently made because of poor equipment. Inspection

should be and can be so planned and carried out as to eliminate bad apparatus and promote the use of good standard equipment, supplies, and reagents.

METHODS AND PROCEDURES

The value of the work done in a laboratory usually is more a function of the method or procedures followed and of the accuracy and intelligence with which they are adhered to than it is a function of the housing and equipment. It is desirable there be definite agreement on the part of the person in charge of a laboratory before approval is extended that any test or analysis will be made strictly in accordance with specified methods. These may be the standard methods of the American Public Health Association, the Association of Official Agricultural Chemists, or another similar organization, or it may be preferable to specify they be the latest edition of the particular method approved by the supervising agency, which in turn can be made the standard method most widely recognized. Standard methods national or international in scope may not be altogether applicable to local situations or quickly amenable to changed conditions. It is a wise precaution to provide authority not only for demanding adherence to methods and procedures drafted by the regulating authority but also for setting up the machinery to modify them from time to time when the need arises.

LICENSING OF PERSONNEL

In some states the licensing of personnel is considered a sufficient safeguard against laboratory work of poor quality without any requirements affecting the laboratory itself; in other places, licensing of personnel is merely a prerequisite for approval of the laboratory; in still others, approval is extended without the actual issuance of licenses

to the personnel. It is sometimes customary to require the applicant for a license or a certificate of proficiency either to pass an examination or to submit credentials from an accredited institution of learning which certify that certain courses in bacteriology, chemistry, or public health have been completed with satisfactory passing grades. In one state a person passing an examination to do the simpler tests must later take a second, or even a third, test before receiving a license to make other more complicated determinations or to take charge of a laboratory. In Connecticut the person in charge of an approved laboratory must possess certain qualifications evidenced by investigation of credentials or by examination conducted by the approving authority. Full responsibility for the operation of the laboratory is then placed on his shoulders and the credentials of the other workers are not investigated. The qualifications of the heads of laboratories that are merely registered are not investigated since no responsibility is assumed by the registering authority for the quality of the work in those laboratories. This is because registration is considered merely as notice that laboratory tests are being made at that particular place without having the endorsement of the state department of health.

RESPONSIBILITY OF THE HEAD OF THE LABORATORY

When approval is extended to a laboratory, the writer believes that some person—ordinarily the one in charge—should be made strictly accountable for the accuracy of the work done and for the reliability of the interpretations issued from the laboratory. Experience has indicated that requiring the signature before a notary of the person concerned brings home the seriousness of the approval agreement in an effective way.

The person in whose name the laboratory is approved may be required to subscribe under oath to some such signed statement as the following one:

A. I agree that the conduct of the laboratory will be strictly in accordance with recognized standards of laboratory ethics and that no method or procedure will be followed that does not meet the approval of the certifying agency.

B. I agree that no examination aside from those listed on my application blank, will be made without notice being given promptly in writing to the approving agency that such an examination has been made. I also agree that as the person in charge I will upon request furnish the approving agency with a complete description of any method or procedure followed in making any specified determination for which approval is extended.

C. I agree to be responsible for the accuracy and reliability of the findings made by any person or persons employed in the laboratory, and for any interpretation based upon those findings.

D. I agree that if at any time I am engaged on a part-time basis I will inform the approving agency of the approximate amount of time given to this position.

E. I agree that in the event I sever my connection with the laboratory, or am about to sever it, I will immediately notify the approving agency in writing and return the certificate of approval; and also that I will notify the approving agency in writing prior to taking extended leave-of-absence.

F. I agree to return, on December 31 of each year, the certificate of approval issued for the expired year.

COSTS AND FEES

The question may be asked: Do the benefits from registration and approval justify the costs involved? Similar questions were doubtless asked when licensing of physicians was an issue before the public and when other licensing and supervisory measures were first proposed. Upon the extent of the need for it should the decision to undertake the project rest, rather than upon the costs that will be entailed. Aside from salaries for clerical work and the cost of certificates and printing, the chief expense will be for time and travel of the inspector or supervisor. He should

be a trained and experienced public health laboratory expert and should have an adequate salary. A well trained man can visit several laboratories in one day if they are not too widely separated and do a thorough job of inspecting. If the health department is the approving agency, a person already a member of the laboratory staff may be assigned to this work on a part-time basis and thus approval be combined with a sort of liaison service between the department and the local health officers and the staffs of local hospitals and institutions in a way that both lessens the cost of supervision and further justifies the expense. Fees may be charged for registration to cover in part the inspection costs, but this has not been done in Connecticut. At least one state provides state aid to approved laboratories but need has not been felt for that in Connecticut.

THE VALUE OF AN APPROVAL SYSTEM

At times there are issued from public health laboratories reports of findings that are inaccurate, and interpretations of laboratory tests ranging from conclusions merely misleading to opinions which may upon occasion adversely affect the health of the public, shorten the lives of citizens, or ruin the reputations of milk producers or other individuals. Erroneous or fallacious laboratory reports and conclusions tend to lower the confidence of the public in the work of laboratory testing in general. Very occasionally unreliable reports are the outcome of dishonest attempts to mislead. Far more often they result from careless or thoughtless errors on the part of well meaning persons improperly qualified and experienced to make and interpret particular tests. Perhaps even as frequently mistakes occur because the analyst has failed to follow an improved and up-to-the-minute procedure that should have been readily available to him or because he

has used poor equipment, supplies, or reagents that have rendered the findings unreliable. Once in a while an experienced person in charge of a busy laboratory may base an interpretation upon unreliable findings or upon tests made by an unqualified or careless person.

If the person in charge of a laboratory is legally required to obtain a certificate of approval before reporting any test where the results will be used or published, this step will go far toward improving the quality of the work providing a well organized system of approval and inspection gives opportunity year after year for education and coöperative effort to function along with the regulatory aspects of approval. If the laboratory director has agreed under oath to surround the work with a variety of safeguards, is he not more likely to supervise each analysis carefully and to weigh well the conclusions based upon the laboratory findings? Requirements for adequate housing and standard equipment, apparatus, and reagents are desirable, but even more important is provision for determining the qualifications of the person in charge—either by examination or through investigation of credentials—before approval is extended. It is likewise important that the person in whose name approval is granted be required to sign an agreement with the certifying agency that specified standards for high grade work will be consistently maintained and that acceptable methods and procedures will be followed.

Experience in Connecticut indicates that under a system of approval laboratories issue fewer conflicting reports than formerly and that there are less complaints from physicians and patients and not so many objections from persons whose products are under test. Improvement of methods can be secured by a process of selection of the best technics without deadly standardi-

zation taking place. Under a system of approval, which need not be unduly expensive, there is added incentive for persons owning and operating laboratories to man them with qualified personnel and increased opportunities for technicians to demand proper equipment and supplies with which to work. This is bound to lead to service of better quality. Research activities can be stimulated toward discovery of new methods. In several instances a statewide association of laboratory directors and technicians has been the outgrowth of a system of approval—evidence that benefits arise from the system.

With a carefully planned system of laboratory approval in operation it should seldom be necessary for the vested authority to be exercised, but the machinery is set up for preventing the bungler or the novice from issuing laboratory reports, for supervising the shyster laboratory, and for improving the quality of work in the laboratory where the training or experience of the

personnel is barely adequate for carrying on the variety of tests for which approval has been extended. With compulsory registration of all public health laboratories with the state health department and provision for approval of those that meet specified requirements, the state or commonwealth need not interfere in the business, or with the livelihood, of any of its citizens; yet this important public health service will be placed on a higher plane to the benefit of many persons. By means of educational efforts and well directed publicity the public can be taught to expect differences in the service rendered by the approved laboratory from that to be expected from the one which is only registered. It would seem that no laboratory should be the worse for being under a properly conducted system of registration and approval, and certainly the poor laboratory should be improved or show cause to the public why it should continue to prosper or even to exist.

Development of International Coöperation Among the Health Authorities of the American Republics

HUGH S. CUMMING, M.D., F.A.P.H.A.

Surgeon General (Ret.), U. S. Public Health Service; Director of the Pan American Sanitary Bureau, Washington, D. C.

INTERNATIONAL Sanitary relations leading to coöperative effort among the health authorities of the American Republics have followed a harmonious and evolutionary course over a period of half a century; that is, since the general health conference which met in Washington in 1881, at which both European and American countries were represented.

At the First and Second International Conferences of American States, held respectively in Washington in 1889, and in Mexico City in 1901-1902, international public health was a leading subject in the agenda. The latter of these conferences recommended that—

A general convention of representatives of the health organizations of the different American Republics shall be called by the governing board of the International Union of American Republics to meet at Washington, D. C., within one year from the date of the adoption of these resolutions . . . that said convention shall provide for the holding of subsequent sanitary conventions . . . that it shall designate a permanent executive board . . . to be known as the International Sanitary Bureau with permanent headquarters at Washington, D. C.

These brief quotations set forth the historical background involved in the

creation of the Pan American Sanitary Bureau and the Pan American Sanitary Conferences, 9 of which have been held to date, the 10th being scheduled to meet in Bogotá, Colombia, in September of this year. Previous conferences of this series have been held in Washington in 1902 and 1905; Mexico, 1907; San José, 1909-1910; Santiago, Chile, 1911; Montevideo, 1920; Habana, 1924; Lima, 1927, and Buenos Aires, 1934.

In addition, between the dates of the meetings of the sanitary conferences, the Directing Heads of the National Departments of Health of the American Republics have lately been called to meet in Washington to discuss administrative and other public health problems of mutual interest, at intervals of 5 years. Three of these latter meetings have been realized: in 1926, 1931, and 1936.

Sanitary Conventions or Treaties—
The Second International Sanitary Conference, held in Washington in 1905, concluded *ad referendum* the Sanitary Convention of Washington, which was ratified by Costa Rica, Cuba, Chile, Ecuador, United States of America, Guatemala, Mexico, Nicaragua, Peru, and Venezuela; and adhered to by

Brazil, Colombia, El Salvador, and Honduras. This first treaty of international American public health became therefore applicable in 14 of the 21 American Republics.

At the Seventh Pan American Sanitary Conference held in Habana in 1924, the Sanitary Convention of Washington was amended, rewritten, and renamed the Pan American Sanitary Code, and has been ratified by all the American Republics. It bears the distinction of being the first Pan American treaty to be accorded this unanimous approval.

The Pan American Sanitary Bureau — Although the organization of the International Sanitary Bureau was effected by the First International Sanitary Convention in 1902, this body did not take actual form as an autonomous entity until the year 1922, following its reorganization by the Sixth Pan American Sanitary Conference of Montevideo, Uruguay, in 1920, and coincident with the beginning of the publication of the *Bulletin of the Pan American Sanitary Bureau*. Its further development and recognition were materially aided by the adoption of the Pan American Sanitary Code, which more clearly defined its functions and duties.

As at present constituted, the Pan American Sanitary Bureau consists of an honorary director, a director, a vice-director, a secretary, 4 members, and the provisional president of the forthcoming Pan American Sanitary Conference, all elected by the Ninth Pan American Sanitary Conference at Buenos Aires (1934) and constituting the Directing Council. All sections of the Americas are thereby represented. Under the terms of the Pan American Sanitary Code, a fund of not less than \$50,000 is contributed annually by the 21 American Republics to carry on its activities.

Traveling Representatives — As an

effective and practical means of attaining its aims of coördinating the health activities of the Republics of the Americas, the Sanitary Bureau has appointed from time to time traveling representatives. Their mission is to coöperate with the national health authorities of the various Republics. Since 1927, 12 such representatives have been named, 4 being on duty at the present time. In addition, 3 sanitary engineers, engaged in mosquito studies and surveys of public water supplies and sewage disposal systems are similarly employed.

Of signal interest in the international public health field has been the work of these representatives especially in the antiplague campaigns in the Republics of Ecuador and Peru, since 1929 and 1930, respectively. Active measures have been carried out for trapping and poisoning of rats, flea surveys, study of the epidemiology of active foci of disease, and especially aiding in the prompt reporting of human cases and deaths from plague, and of rodent infection, to the Pan American Sanitary Bureau and through this agency to the health authorities of the American Republics and to the International Office of Public Health with which the Sanitary Bureau coöperates.

Another disease of international import, viz., yellow fever, has received considerable attention. Traveling representatives have been detailed to coöperate in the studies of the Rockefeller Foundation, and special measures have been adopted to vaccinate against yellow fever the crews of airships in international traffic and to promote vaccination of flight personnel of national airways in each country. Under a coöperative plan devised by the Pan American Sanitary Bureau, certificates of origin are provided for air travelers in international traffic when deemed expedient, in an endeavor to have a record of their whereabouts dur-

ing the 6 days prior to departure from yellow fever endemic areas.

Reporting of disease—To be of any value, the reporting of dangerous communicable diseases must be prompt and complete. By cable, by airmail, and by ordinary correspondence, the Sanitary Bureau constantly receives reports of diseases from the American Republics. These data are compiled and immediately released in the form of a *weekly report* mailed to all the sanitary authorities of the Pan American countries and to interested international health organizations. Whenever urgent, the information is cabled or sent by air mail.

Publications—In line with the purposes for which it was created, the bureau has endeavored to broaden its scope by a far reaching program of education in preventive medicine and sanitary science, especially adapted to the needs of the health officer, the practising physician, the sanitary engineer, the visiting nurse, and other health workers. Consequently, it has been the policy of the bureau to have its monthly *Bulletin*, with a present issue of approximately 9,000 copies, distributed as widely as possible. The *Bulletin* is thus received by physicians and health authorities and others concerned, in almost every town of 2,000 inhabitants or over throughout the Latin American Republics. Although the material is mostly in Spanish, articles are also carried in French and Portuguese and occasionally in English. If there is no local physician in a small village, attempt is made to reach a pharmacist, nurse, teacher, midwife, or some other person in the locality who may be interested in the prevention of disease and in the conservation of the health and well-being of the people.

Coöperation with international health agencies—The bureau follows closely the work of the International Health Division of the Rockefeller Foundation in matters involving health prob-

lems in the Americas. Moreover, the Constitution and By-Laws provide that "The Pan American Sanitary Bureau shall coöperate with the International Office of Public Health of Paris, and also with other international bodies such as the Health Section of the League of Nations."

Through an exchange of correspondence, and under the provisions of Article 7 of the International Sanitary Convention (Paris, 1926), the Pan American Sanitary Bureau acts as the Regional Agency of the International Office of Public Health of Paris in the collection and transmission of information relating to health and sanitary conditions in the American Republics. By virtue of this arrangement, the Pan American Sanitary Bureau transmits to the Paris Office reports of communicable diseases occurring in the republics of the Western Hemisphere, and in turn relays to them the reports received from that Office relating to such diseases in other parts of the world. This arrangement avoids duplication of effort and provides a satisfactory basis of coöperation and understanding in international health relations between the Eastern and Western Hemispheres.

Miscellaneous activities—The Pan American Sanitary Bureau follows very closely all international medical relations in which the American Republics are concerned, usually being represented at important health congresses of whatever nature. No opportunity is overlooked to bring about better understanding among scientific health workers, especially those of the medical and engineering professions.

Following the recommendation of several conferences in the past, the bureau undertook the translation of the latest edition of the *Pharmacopœia of the United States* into Spanish, in order that it may be made available in those countries where this language is spoken. This was undertaken in coöperation

with the Board of Trustees of the United States Pharmacopoeial Convention, its main purpose being to secure better and more nearly uniform standards of strength and purity for the drugs used in the treatment and prevention of disease, and also to serve as a ready reference to those countries in the preparation of their own national pharmacopoeias.

Another of the important activities of the bureau is its mission as a consulting agency. Inquiries are constantly received from health officers and others involving problems of public health administration, treatment, research, statistics, and many other features.

The bureau also compiles and publishes vital statistics of the American Republics.

CONCLUSION

This brief survey of the Pan American Sanitary Conferences and the Pan

American Sanitary Bureau sets forth their historical background and their development over a period of half a century, though most of the activities of the bureau have been developed within the last decade. In a harmonious and coöperative spirit, it has been possible to attain the elimination of drastic quarantines, to secure the prompt reporting of quarantinable diseases, to aid in obtaining increased appropriations for public health work, and to demonstrate the usefulness of the Pan American Sanitary Conferences and their executive organ, the Pan American Sanitary Bureau, in the ever increasing field of international coöperative measures in the interest of all the people of the various republics concerned.

NOTE: This paper was presented before Le Comité Permanent d l'office International d'Hygiène publique, May, 1938.

Positions and Rates of Pay in Public Health Agencies*

ANTHONY J. BOROWSKI, DR.P.H.

*Research Analyst, National Health Inventory, U. S. Public Health
Service, Washington, D. C.*

THE positions of 19,000 persons as reported by health agencies with an annual pay roll of some \$23,000,000 should, on analysis, be of interest to the public health administrator and to the employee. Distribution of various types of employees within a given budget reflects the nature and extent of a program since approximately 75 per cent of the expenditures among health agencies covered by this study were consumed by salaries paid to staff members. Indexes, such as average salaries, may be of assistance to the administrator in allocation of funds necessary to supply the personnel required for contemplated health activities. Average salaries received by groups of employees with varied training and technical qualifications offer to the prospective public health worker some information in regard to opportunity for remuneration in this rapidly developing field of public service.

Information about employed personnel which forms the basis for this study was submitted among other data by some 2,500 agencies in health jurisdictions confined to areas within county limits. These agencies functioned in 94 counties of 19 states scattered throughout various sections of the

country. The total inhabitants numbered approximately 34,000,000. As may be noted in Table III, the sample is heavily weighted with populous counties and with those having a high percentage of urban inhabitants; within this sphere, however, it presents a satisfactory cross-section of the social, economic, and industrial development of the United States. Data received from the 2,500 classified public health agencies were not in every case suitable for analysis, inasmuch as some 650 organizations rendered public health service in a limited fashion or to such a small degree that returns would have little meaning for this study. The majority of these were primarily interested in phases of activity other than that of rendering direct public health service. This group may be dismissed with the statement that they were not operating agencies in the public health field, although they bore such classification in local directories. The detailed discussion will, therefore, deal with data submitted by 1,861 agencies having some tangible organization and program.

Of the 1,861 agencies studied, approximately 75 per cent were under governmental control, and are referred to as official agencies. This percentage includes a large number of lone health officers; the great majority of whom devoted only a part of their time to

* From the Division of Public Health Methods, National Institute of Health. Study conducted in connection with the National Health Inventory.

TABLE I

Distribution of All Full- and Part-time Employees in Health Agencies of 94 Counties According to Type of Employing Agency

Types of Agencies	Total Agencies	Distribution of Personnel								
		Number of Personnel			Personnel per Agency			Personnel per 100,000 Population *		
		Total	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time
All agencies	1,861	18,917	12,574	6,343	10.2	6.8	3.4	55.7	37.0	18.7
Official	1,419	13,126	9,283	3,843	9.2	6.5	2.7	38.6	27.3	11.3
Health departments	295	10,077	7,996	2,081	34.2	27.1	7.1	29.6	23.5	6.1
Lone health officers	780	780	48	732	1.0	0.1	0.9	2.3	0.2	2.1
Other official	344	2,269	1,239	1,030	6.6	3.6	3.0	6.7	3.6	3.1
Nonofficial	442	5,791	3,291	2,500	13.1	7.4	5.7	17.1	9.7	7.4
Maternal and child hygiene	77	650	351	299	8.4	4.5	3.9	1.9	1.0	0.9
Tuberculosis	54	923	291	632	17.1	5.4	11.7	2.7	0.9	1.8
Nursing	51	1,693	1,533	160	33.2	30.1	3.1	5.0	4.5	0.5
Other nonofficial	260	2,525	1,116	1,409	9.7	4.3	5.4	7.5	3.5	4.2

* Total population 33,978,479

health duties. The other agencies were non-governmental and carry the designation of nonofficial or voluntary. Table I presents the distribution of all full- and part-time individuals according to type of health agency. Briefly, official agencies engaged on the average 6.5 full-time and 2.7 part-time persons, as compared with 7.4 full-time and 5.7 part-time persons employed by the nonofficial group. If health departments alone are considered the number per department was considerably higher, being approximately 27.1 full-time and 7.1 part-time persons. The total number of people em-

ployed by all health agencies per 100,000 inhabitants was 55.7. The rate for full-time and part-time employees was 37.0 and 18.7 respectively. Approximately three-fourths of the full-time and three-fifths of the part-time workers were employed by the group of official agencies.

Nurses constituted the largest single group of full-time employees in both the official and nonofficial group (Table II). In relation to personnel of other classes the proportion of nurses was much higher, however, for the non-official agencies than for the official. The 295 health departments reporting

TABLE II

Distribution of All Full- and Part-time Employees in Health Agencies of 94 Counties According to Type of Agency and Type of Personnel

Employed Personnel of Different Types Devoting Full- or Part-time to Duty

Types of Agencies	Total Agencies	Total Personnel		Staff Physicians		Clinic Physicians		Nurses		Dentists		Inspectors		All Others	
		Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
		time	time	time	time	time	time	time	time	time	time	time	time	time	time
All agencies	1,861	12,574	6,343	557	1,364	312	1,978	5,795	481	136	682	1,162	218	4,612	1,620
Official	1,419	9,283	3,843	523	940	259	1,273	3,763	267	92	262	1,159	214	3,487	887
Health departments	295	7,996	2,081	442	378	160	915	2,921	143	76	140	1,157	200	3,240	305
Lone health officers	780	48	732	6	263	...	...	...	...	...	...	...	...	42	469
Other official	344	1,239	1,030	75	299	99	358	842	124	16	122	2	14	205	113
Nonofficial	442	3,291	2,500	34	424	53	705	2,032	214	44	420	3	4	1,125	733
Maternal and child hygiene	77	351	299	14	23	32	149	145	41	2	2	...	...	158	84
Tuberculosis	54	291	632	1	5	6	186	74	16	2	152	...	...	208	273
Nursing	51	1,533	160	...	6	...	80	1,324	46	...	4	1	...	208	24
Other nonofficial	260	1,116	1,409	19	390	15	290	489	111	40	262	2	4	551	352

in this study employed 2,921 full-time and 143 part-time nurses, or an average of 9 nurses in all for each 100,000 population. Nonofficial agencies employed an average of 6.6 nurses for a similar population unit. The agencies combined reported 5,795 full-time and 481 part-time nurses, or an average of 18.5 per 100,000. Second in order of magnitude was the group designated "all others." This term is rather inclusive but for practical purposes it may be taken to mean clerical personnel. True, engineers, bacteriologists, chemists, and statisticians are included but they were not numerous in proportion to the total. The third largest class of people employed was that of inspectors. Such workers, as a rule, were not found in voluntary agencies since they are usually engaged on activities which require the application of sanitary laws that only representatives of government are empowered to enforce. Thus, as expressed by pay roll structure, sanitation—an activity of official agencies for many years—even today is playing an important rôle in the program of health departments.

Medically trained persons made up the group ranking next in number; 782, or 8 per cent of all full-time persons in official health agencies, were physicians. Of these, two-thirds were staff members, while the others were employed exclusively in clinics. On the other hand, but 87, or less than 3 per cent

of the full-time personnel listed by the nonofficial group, were reported to have had medical training. The relatively small number of full-time physicians rendering public health service was offset somewhat by the large number of physicians serving on a part-time basis. In the official group of agencies 2,213 employees, or 57 per cent of the part-time personnel, were medically trained; for the nonofficial group 1,129, or 45 per cent, were of this class.

Only 136 full-time employees in both the official and nonofficial agencies were dentists, but it is well to note that oral hygiene programs as a rule are sustained in a large measure by part-time dentists and by dental hygienists who do not hold a regular degree in dentistry.

Because of the nature and content of programs, employees of a particular class may be expected to predominate in the staff of certain organizations. Nursing agencies, for example, employed a greater number of nurses in proportion to the total personnel than did other organizations. The agencies classed as "other official," mostly schools, showed a high ratio of staff physicians to all personnel employed. The nonofficial group of agencies with maternal and child hygiene as their chief interests employed proportionately more clinic physicians than did any other type of agency. Organizations concerned primarily with tuberculosis engaged a high proportion of employees

TABLE III

Employment Rate of Different Types of Full-time Personnel in Health Agencies of 94 Counties According to Population of the County

Full-time Personnel per 100,000 Population						
Total	Physicians		Nurses	Dentists	Inspectors	All Others
	Staff	Clinic				
37.0	1.6	0.9	17.1	0.4	3.4	13.6
17.8	1.0	0.0	11.1	0.0	1.0	4.7
14.1	1.2	0.0	8.4	*	1.0	3.5
18.6	1.5	0.3	8.8	0.1	2.2	5.7
32.2	1.7	0.3	15.3	0.3	3.1	11.5
40.1	1.8	1.2	13.2	0.5	3.7	14.9

in the unspecified class designated as "all other."

For comparative purposes, staffs were also considered in terms of the number of employees per 100,000 inhabitants in counties of different population groups. Table III presents such rates. All of the health agencies studied, when combined, employed 37 full-time persons per 100,000 population. The group of counties with 500,000 or more inhabitants revealed the highest rate, which was 40.1. It may be readily observed that, in general, the rate for each class of employee increased as the counties were found in higher population classes. Counties with less than 20,000 inhabitants showed deviation from this array in two instances. Nurses and the class designated "all others," showed a higher rate per 100,000 than that found in the group of counties next in order of size.

As noted previously, relatively few dentists and clinic physicians serve on a full-time basis. A striking point is the rapid increase in rate of employment for persons designated "all others" as counties occupy larger population groups. In some degree this increase represents additions to the technical staff of engineers, laboratory workers, statisticians, and persons with related training, but a much larger proportion is due to the greater number of clerks and helpers of various types.

The average annual salary of whole-time staff physicians was higher in health departments than in either the

other official or the nonofficial group of agencies. This is made evident in Table IV. Nonofficial agencies paid the medical group an average salary of \$2,911, as compared with \$3,014 in health departments and \$2,141 in the other official group. Clinic physicians received a much smaller salary, the sum being lower than one might expect. The average salary of this group as reported by all agencies was \$1,636. This does not appear comparable with salaries paid to other employees of similar or lower grades.

The average remuneration for nurses in the several types of agencies was about \$1,500. This uniformity is perhaps due to two factors: (1) the large number of nurses reported; and (2) the basic similarity in their training and duties. The divergence in salaries paid to dentists by official and nonofficial agencies was as great as that found in the case of clinic physicians. However, nonofficial groups paid dentists lower salaries than did governmental agencies, whereas their practice was reversed with respect to payment of clinic physicians. Inspectors were paid an average salary of approximately \$1,900 by health departments, but this figure cannot be contrasted with those of other agencies since so few employed inspectors. The remaining miscellaneous group of health department employees averaged in salary \$1,545 per person or approximately \$250 more per year than the amount received by the nonofficial miscellaneous group.

TABLE IV

Number of Full-time Employees in Health Agencies of 94 Counties and the Average Salary Paid to Specified Types of Personnel by Agencies of Each Class

Type of Personnel	All Agencies		Health Departments		Other Official		Nonofficial	
	Number of Employees	Average Salary	Number of Employees	Average Salary	Number of Employees	Average Salary	Number of Employees	Average Salary
Staff physicians	557	\$2,881	442	\$3,014	81	\$2,141	34	\$2,911
Clinic physicians	312	1,636	160	1,415	99	1,659	53	2,263
Nurses	5,795	1,484	2,921	1,463	842	1,503	2,032	1,507
Dentists	136	1,961	76	2,151	16	2,171	44	1,556
Inspectors	1,162	1,915	1,157	1,915	2	1,890	3	1,876
All others	4,612	1,472	3,240	1,545	247	1,315	1,125	1,297

As a supplement to the data on full-time employees and their respective average salaries found in Table IV, some mention should be made of the 780 lone health officers. Of the 732 who served on a part-time basis, 452 reported data on money received; the others either received no compensation or failed to record satisfactory information on this question. Only 10 of the 452 received more than \$1,000. The average for all was \$197 per year, while the highest paid received \$2,400. Among the 47 full-time lone health officers, the lowest salary was \$300, the highest \$4,000, and the average \$1,470.

Of the 1,861 health agency administrators, including the lone health officers, 21 per cent failed to record salaries and 12 per cent received none. Most of those who gave no information regarding their salaries were in charge of official agencies. Among the group reporting on salary no full-time administrator of an official agency worked gratuitously, but there were 8 with nonofficial organizations who served without pay. In 95 official and 104 nonofficial agencies part-time administrators received no remuneration.

ployment. The median salary and interquartile salary range for directors of each classification are also shown. The largest number of full-time executives in the official groups were physicians with a salary range of \$3,205 to \$5,683 paid to the middle 50 per cent. The remuneration of those serving as full-time heads agrees very closely with the observation made by Leven.¹ According to his report in the findings of the Committee on the Costs of Medical Care, the median remuneration of all salaried physicians in the United States was \$4,213. The median salary for 107 full-time heads in the official group of this study was \$4,214, and in the nonofficial group the figure for 17 full-time heads was \$4,500.

Fifty per cent of the full-time administrators in the nonofficial group were nurses, with a median salary of \$2,015. This was approximately \$550 more than that paid to nurses serving as administrators in the official group. Lay persons served as full-time heads in 124 agencies. In official agencies the median salary of the full-time group was \$1,632 and in the nonofficial group of agencies, approximately \$1,906.

TABLE V

Median Salary and Interquartile Salary Range for Full- and Part-time Administrative Heads of Official and Nonofficial Health Agencies in 94 Counties According to the Professional Training of Administrators

Administrative Heads of Official and Nonofficial Agencies	Number of Administrative Heads		Salary Paid to Each Type of Administrator			
	Full-time	Part-time	Median		Range of the Middle 50 Per cent	
			Full-time	Part-time	Full-time	Part-time
Official						
Physicians	107	390	\$4,214	\$343	\$3,205-\$5,683	\$163-\$927
Registered nurses	80	29	1,450	456	1,184- 1,716	206- 719
Other professional persons	47	28	3,410	333	2,469- 5,412	138- 630
Laymen	69	256	1,632	98	1,125- 2,475	31- 208
Nonofficial						
Physicians	17	19	4,500	1,550	3,524- 6,438	488- 4,083
Registered nurses	103	12	2,015	750	1,505- 2,831	350- 1,250
Other professional persons	30	6	2,250	1,050	1,650- 3,525	775- 2,500
Laymen	55	6	1,906	1,000	1,172- 2,891	925- 1,013

In Table V are presented, on the basis of professional training, the reporting group of 1,254 administrators, classified as to full- or part-time em-

Those administrators with training classed as "other professional" constituted the minority in both groups of agencies; however, it is noticeable that

the median salary of such heads was higher in the official than in the non-official group. Full-time heads with other professional training received a median salary of about \$3,410 in official agencies as compared with about \$2,250 in the nonofficial.

Over 90 per cent of the part-time administrators of official agencies were either physicians or lay persons. In contrasting the two, the salary range of the middle 50 per cent for physicians was distinctly higher than that for the laymen, since 25 per cent of the latter received less than \$31 per year for their services. Although only 43 non-official agencies were directed by part-time heads, the analysis did not show the same predominance of physicians and lay persons.

In summary, it may be said that herein are presented data pertaining to opportunities for employment in 1,861 local public health agencies, including both official and nonofficial organizations. With few exceptions, this is a complete coverage of remunerative positions in 94 counties. From these data one cannot draw conclusions regarding the nation as a whole since the study counties represent the more populous areas where organization for public health is above the average. This analysis reveals, however, that more than one-third of all agencies studied consisted simply of lone health officers, nearly all of whom served on a part-time basis. Furthermore, in the agencies which engaged more than one person, one-third of the employees also

served on a part-time basis. A higher percentage of personnel employed by nonofficial agencies than by official were classified as part-time employees.

Nearly one-half of the 12,574 full-time personnel employed by the 1,861 health agencies under discussion were nurses. Employees designated "all others" ranked next to nurses in number. This category is composed chiefly of clerical personnel, although a relatively small number of engineers, bacteriologists, chemists, and statisticians are also included. In both official and nonofficial agencies physicians and dentists were more frequently employed for part-time service than for full-time.

The average salary paid to full-time personnel by all classes of health agencies was as follows for the various types of employees: staff physicians, \$2,881; clinic physicians, \$1,636; dentists, \$1,961; inspectors, \$1,915; nurses, \$1,484; and all others, \$1,472. Salaries varied according to the administration of the agency. Some part-time administrators donated their services; this practice was more frequently followed in nonofficial agencies than in official. Physicians received higher salaries than administrators of any other type in both nonofficial and governmental agencies. In general, both full- and part-time administrators drew higher salaries in nonofficial agencies than in official.

REFERENCE

1. Leven, Maurice. *The Incomes of Physicians*. Committee on the Costs of Medical Care, The University of Chicago Press, Dec., 1932, p. 20.

Trichinelliasis in San Francisco*

M. HOBMAIER, M.D., AND J. C. GEIGER, M.D., F.A.P.H.A.

*George Williams Hooper Foundation for Medical Research; and
Department of Public Health, San Francisco, Calif.*

SINCE the perfection of newer methods of diagnosis, trichinelliasis in the United States has attracted wide attention. It has been stated that from 5 to 30 per cent of the population has been found to carry trichinellae. The public health officer must consider these figures with some degree of skepticism. Serologic and digestion methods enable the investigator today to detect not only clinical trichinelliasis, but also the so-called zoölogical trichinelliasis. The latter comprises about 75 per cent of all cases, a few trichinellae being found, which may be quite insignificant from the standpoint of public health. The figures in all likelihood are the result of more perfected methods, and not those of an increase in actual clinical infections. Furthermore, results are available as to infections in cadavers, and this method of investigation necessarily cannot discriminate between infections of several years' standing, but must include all infections which may have occurred, perhaps without symptomatology.

What health officers need is that a diagnosis be made during the onset of the disease and the case promptly reported, so that the source may be found and further infections prevented. The figures obtained by such methods would be considerably lower, and

would probably not differ greatly from those of early investigators.

The responsibility of avoiding trichinelliasis is placed by the regulations of the meat inspection laws to a great extent on the consumer. Cases continue to occur in San Francisco, showing that the existing policy is not without danger. Difficulties may arise through violations of the existing laws by producers and lack of care on the part of consumers.

In civilized countries, trichinelliasis in man is connected with the consumption of pork food products carrying viable parasites. Other sources, such as bear, wild hog, badger, dog-meat, can usually be avoided. Some countries have tried to prevent infections in man by examination of every hog slaughtered. In the United States, this has been tested, but abandoned as impracticable. If trichinelliasis in pigs could be prevented, there would seemingly be no trichinelliasis in man. How market hogs become infested and how this may be prevented has interested the San Francisco Department of Public Health since 1934. This paper deals partly with such efforts and the conclusions resulting from the investigations.

Many of these conclusions have been admirably expressed by Hall.¹ The senior author, Hobmaier, had reached identical conclusions in July, 1936.

* Summary of Investigations 1934-1935.

Likewise, McNaught and Anderson² have reported on their investigations in San Francisco.

From 1927 to 1937, inclusive, there have been reported 212 cases of trichinelliasis in San Francisco, with 6 deaths. The largest number reported was in 1930, 54 cases, and 1 death; and in 1937, 9 cases and 1 death, the latter being the smallest number since 1927. In an analysis of the alleged causative food products, 51 were due to pork roasts and chops, 40 to pork sausages, mainly of the variety served at cocktail parties, 42 to salami, 9 to pickled pork, 9 to mettwurst, and 1 to bear meat. There has not been a case traced to salami manufactured commercially in San Francisco since the promulgation of stringent regulations by the Department of Public Health in 1934.

Only 16 specimens of the suspected pork or pork products were obtained for laboratory examination, and only 4 were proved positive. This shows how difficult it is to obtain the suspected food for investigation. When pork or pork products are blamed for cases or outbreaks, it is rare, despite efficient health organization, to secure evidence other than epidemiologic. Of the human cases, the laboratory diagnosis was made from muscle tissue on autopsy in 6, by skin test in 8, and by eosinophilia in 88.

The trichinella is a parasite of a great variety of hosts, among which, and of especial interest here, are those living in close relationship to man; namely, the pig, rat, cat, and dog. The rat only has preserved the natural cycle of propagation of trichinella from rat to rat without obligatory introduction of the parasite from outside. The main outside sources for infections in rats are pork and pork food products, the remote source being infected cats or dogs. In man, the trichinella has no means of propagating, and in the cat

or dog it occurs rarely. Trichinellae in man, cat, and dog, therefore, are dead ends in the life cycle. It is possible for rats to feed on carcasses of cats and dogs killed on highways by automobiles. The valuable assistance given by the Humane Society for Prevention of Cruelty to Animals of San Francisco in eradication of trichinelliasis by the safe destruction of thousands of dogs and cats each year deserves special mention.

The natural cycle of trichinelliasis from pig to pig has been ordinarily interrupted, because pigs are unlikely to feed on carcasses of other pigs. The possibility of transfer of trichinellae in pigs by feeding on infected feces seems to be quite remote, and placental infections apparently do not occur.³ The original cycle, however, may be re-established where infected pork and pork products are fed to pigs. It is possible that where this condition exists the feeding on infected rats is a secondary source, and still more remote is the possibility of infections by feeding on carcasses of infected cats or dogs. Moreover, on premises where infected pork or pork products are fed to hogs, the rats are likely to show a high incidence of trichinellae.

In 1935, there were examined for trichinellae 2,000 rats trapped in San Francisco: *Rattus alexandrinus*, 147, with 1 rat infected; *Mus rattus*, 237, 3 infections; and *Mus norvegicus*, 1,616, 125 infections. The distribution of the trichinella cases among the rats is shown in Table I.

TABLE I

Weight Grams	Rats Investigated	Infected Specimens	Percentage of Infections
Up to 50	104	0	0
100	438	3	0.7
150	206	2	1.0
200	159	8	5.0
250	142	11	7.7
300	129	19	14.7
350	155	22	14.2
400	125	24	19.2
450	91	15	16.5
500 and more	67	21	31.3

The figures in the table were obtained by microscopic examination of the diaphragms of the rats. Of the 129 infected rats 57 were males and 72 females.

The percentage of infections was 6.4. Young rats weighing 150 gm. or less showed 0.7 per cent of infections; middle-aged rats weighing up to 250 gm., 6.3 per cent; full-grown rats weighing over 250 gm., 17.8 per cent. The number and severity of infections increased with weight and age, and may be the result of continued exposure to new infections. In 6 specimens, there were found encysted and blood trichinellae; in 4, young trichinellae and those showing beginning calcification; and in 8, intestinal trichinelliasis combined with muscular trichinelliasis. Among 5 rats partially consumed in traps, one showed encysted trichinellae.

The infected rats were trapped as follows:

Markets	44	Dwellings	6
Abattoirs	36	Apartment	
Stables	11	houses	6
Groceries	3	Vacant lots	7
Warehouse	1	Miscellaneous	
Restaurant	1	places of un-	
Hotels	2	known nature	8

Many other places were investigated, but the rats were found free from infection. The disease seems to be restricted to certain foci where infected food is available. Trichinellae infected rats living in city limits are, of course, no direct menace to public health, provided there are no hog ranches, or that hogs are not maintained in abattoirs for a considerable time. They are a valuable indicator that trichinellae infected pork or pork products are improperly handled, whereby the rat infested premises may become foci of infections. There is no doubt that improper storage of food and carelessness in garbage disposal are sources of rat infestation.

Another focus of infection is repre-

TABLE II

Examination of Rats Trapped on Hog Farms

Hog Ranch	Rats Investigated	Infected Rats	Percentage of Infections
1	170	55	32.3
2	46	15	32.6
3	30	6	20.
4	158	54	34.1
5	62	12	19.3
6	189	52	27.5
7	105	36	34.3
8	17	5	29.4
9	34	8	23.5
10	20	2	10.
11	12	5	25.
12	6	2	33.3
13	24	5	20.8
14	6	1	16.6
15	7	2	28.5
16	6	1	16.6

sented in uncontrolled garbage dumps. Infections may result not only from unsafe human food contained in the garbage and from predatory habits of rats, but also from infected rats trapped in city limits and thrown into the garbage can. Among 161 rats investigated from one of these sources outside of San Francisco, 11.8 per cent were found infected. This is another illustration that garbage disposal of cities has to be carefully supervised.

The results of the examination of rats trapped on hog ranches which feed garbage is of interest as shown in Table II.

These data show 257 (or 28.8 per cent) infected out of 892 rats examined. Trichinelliasis is to be expected in hogs on these ranches. Some information has already accumulated in this regard.

Garbage feeding causes trichinelliasis only in so far as it contains raw or undercooked pork. Infections may be few or even absent when garbage from establishments where great economy is exercised in utilizing food-stuffs is fed. Severe infections may be expected where meat scraps are abundant, as in the garbage of meat markets.

Ten groups, 201 hogs, from 6 to 12 months old, have been investigated.

Fifteen to 20 gm. of muscle tissue of the pillar of the diaphragm have been treated by the digestion-filter, or by a modification of this method. No dead trichinellae have been found.

RESULTS OF EXAMINATION

1. Two pigs raised on garbage dump land. Both pigs infected, one showing 11.1; one, 0.8 trichinellae per gm. of diaphragm.

2. Twenty-nine pigs from a hog ranch near San Francisco feeding garbage from hotels and restaurants of San Francisco, and from three hospitals. Three pigs slightly infected; number of trichinellae 0.5, 0.7, and 1.3 per gm. respectively.

3. Thirty-five pigs from a hog ranch in San Francisco, feeding garbage from hotels, restaurants and from one hospital of San Francisco. Mild infections in 4 pigs: 0.2, 0.4, 0.9, and 1.6 trichinellae per gm.

4. Sixteen pigs from a hog ranch in San Francisco. Source of food, garbage from hotels and restaurants. Two mild cases of infections: 1.2 and 2.8 trichinellae per gm.

5. Seven pigs from a garbage feeding hog ranch near San Francisco. Two pigs were mildly infected: 1.5 and 0.3 trichinellae per gm.

6. Three pigs from a hog ranch near San Francisco. Source of food, garbage from hotels and restaurants, no infections.

7. Twelve pigs from an adjacent county ranch; food sources unknown, no infections.

8. Seventeen pigs from an adjacent county ranch; food sources unknown, no infections.

9. Seventy-nine pigs from the State of Idaho; food sources unknown, no infections.

10. The most severe infection has been observed recently in a hog from a garbage feeding ranch within the city limits. In 1 gm. of pork of pillar of diaphragm were present 1,238 trichinellae; in the muscle at the base of the tongue, 1,643; and in the muscle under the scapula, 144. Home-made salami sausages contained enormous quantities of trichinellae easily demonstrable microscopically. None of them, however, were found alive by digestion and in feeding experiments.

Some information was secured in investigations of breakfast sausages by the digestion-filter method.⁴ The pork used in the manufacture of these sausages came from 20 agencies. Sausages of 5 of these (or 25 per cent) contained viable trichinellae. Examinations repeated over a longer time

would, of course, have increased this number.

Another method, based on similar principles, proved to be very useful. After digestion over night in the ordinary way, the jar is covered with 4 layers of gauze and carefully placed upside down in a funnel filled with tap water. A short piece of rubber tubing of approximately the same lumen as the stem of the funnel is slipped over the stem and closed by a clamp. After 2 hours the living trichinellae have accumulated above the clamp and are drawn off.

It is interesting to note the incidence of trichinellae in cats. The examination of 500 cats showed 54 (or 10.8 per cent) infected. The use of the digestion method is more desirable in examination of cats (and in dogs) than in other animals, because the cysts are irregularly distributed, and the slight infestations which occur may be undetected by ordinary methods. The gravity of infections generally increased with the age and size of the animals. Kittens up to the age of 6 or 7 months were found practically free.

This survey shows trichinellae quite common in certain animals in and near San Francisco, indicating definite sources from which cases of trichinelliasis may originate in man and animals.

CONTROL OF TRICHINELLIASIS *

A relative protection of the population against trichinelliasis is provided under the regulations of the meat inspection of the U. S. Department of Agriculture, Regulation 18, 4:

Inasmuch as it can not certainly be determined, by any present known method of

* The essential points outlined in this part of the paper in regard to origin and control of trichinelliasis were contained in a report to the Director of Public Health, San Francisco, dated from July 8, 1936.

inspection, whether the muscle tissue of pork contains trichinae, and inasmuch as live trichinae are dangerous to health, no article of any kind prepared customarily to be eaten without cooking shall contain any muscle tissue of pork unless the pork has been subjected to a temperature sufficient to destroy all live trichinae, or other treatment prescribed by the Chief of the bureau.

The consequences of this policy are summarized in leaflet No. 34 of the Department of Agriculture,⁵ as follows:

In the final analysis the prevention of trichinosis is a personal responsibility and involves the thorough cooking of all pork. Pork of kinds customarily eaten without cooking are also dangerous unless it is definitely known that such products were prepared in a plant operating under federal meat inspection or equally thorough state or local supervision.

In detail, this policy expresses:

1. Uncooked pork is unsafe, regardless of whether it has been inspected by federal, state or city meat inspection. It has to be made safe by thorough cooking.

2. Pork food products customarily eaten without some cooking (such as pork sausages, for instance) are unsafe, regardless of whether they have been manufactured under federal, state or city meat inspection. They have to be made safe by thorough cooking.

3. Pork food products customarily eaten without cooking are safe, if they have been manufactured in a plant operating under federal, state, or city meat inspection with adequate regulations. No further preparation is required.

4. Pork food products customarily eaten without cooking are unsafe if they have been manufactured in a plant operating without regulations adequate to insure safety.

The prevention of trichinelliasis, therefore, is a personal responsibility and involves the thorough cooking of all pork, especially as in Groups 1 and 2 above. Among 35 clinical cases of trichinelliasis observed in Boston, Spink and Augustine⁶ found only 3 which were caused by raw pork; 15 resulted from eating cooked pork sausages; 9 from boiled ham; 6 from cooked pork chops; 1 from fried ham; and 1 from cooked spare-ribs. An attempt was made in all but 3 cases to

render the pork safe by cooking, but was unsuccessful.

Ninety-nine cases of trichinelliasis in man in San Francisco resulted from consumption of undercooked breakfast pork sausages, chops, and roast; 60 from products customarily eaten without cooking.

The mistake is generally made of cooking pork or pork products inadequately. Some products, such as fried pork sausages, may lose flavor and appearance when cooked ordinarily to destroy suspected trichinellae. The National Live Stock and Meat Board says in one of its leaflets: "The flavor of pork is in the fat; therefore, pork should always be cooked at low temperatures as a high heat melts the fat and the lean is likely to be dry." Considering the low melting point of pork-fat, this is true, but this advice to use a low temperature in preparing pork favors undercooking and, consequently, outbreaks of trichinelliasis. Pork-fat has a low gravity. Pork sausages boiled in water are only partially submerged, usually because they contain a large quantity of fat. Thus, it may easily happen that trichinellae in the submerged portion may be destroyed, while those above the water-line may remain alive.

There is no regulation that breakfast sausages must be free from viable trichinellae; the responsibility rests on the consumer. It would appear logical that manufacturers prepare breakfast sausages only from pork proved to be free from viable trichinellae.

Further technical appliances should be worked out and provided for use in public eating places and homes to insure that pork or pork products be raised to 130° F., if safety against trichinelliasis is to be obtained. A false feeling of security is produced by the declaration, "Federal inspected pork," or "prepared from federal inspected pork." The public is not aware that

Government inspected pork (Groups 1 and 2) is unsafe, so far as trichineliasis is concerned. It is well to advise the public to cook pork thoroughly, but still more important how to do it.

The second part of the policy: "pork of kinds customarily eaten without cooking is also dangerous unless it is definitely known that such products have been prepared in a plant operating under federal meat inspection or equally thorough state or local supervision," refers to the pork in Groups 3 and 4. It is again left to the consumer to decide whether the product is safe. Products of Group 3 are marked with the official markings of inspection. These signs in the case of salami and mettwurst are of doubtful value to the consumer. The markings are made by authorities for authorities, and not, as it justly should be, by the authorities for the information of the buyer. The official markings of each pork food product of Group 3 should show for the buyer the words, "Guaranteed safe 'Meat Inspection. . . .'"

This would permit the purchaser to distinguish safe products of Group 3. As long as pork products of Groups 3 and 4 are found on the market, supervision of those to be eaten without cooking is necessary in the interest of safety.

So far as such products not customarily eaten without cooking are concerned (Groups 1 and 2), local authorities have today no right to interfere. Education in schools, especially in cooking schools, specific regulations in regard to eating places, and the provision of mechanical safety devices for safe cooking seem to be at present the only means of reducing danger of infections. So far as breakfast sausages (Group 2) are concerned, the urgent need to change this policy has already been emphasized.

There have occurred in San Fran-

cisco an approximately equal number of cases of trichineliasis caused by consumption of so-called "Hamburgers." Some benefit probably would result if all meat markets were to sell ground pork and ground beef or Hamburgers separately, and not (as some do at the present time) mixtures of these; and if Hamburgers sold in public eating places were required to consist of ground beef only.

A great number of cases of trichineliasis have been registered following consumption of mettwurst, salami, boiled ham, and pickled pork. Existing laws should prevent trichineliasis from such sources.

The policy of the Meat Inspection law is very definite in its purpose. It provides safe products where the consumer cannot protect himself. It frees the manufacturer of pork food products from obligations where self-protection is attainable. It fails where unchallenged infractions of the law occur on the part of pork producing agencies, and where the public fails to provide self-protection. The prevalence of trichinellae in our daily food and the occurrence of clinical cases would show higher figures than have been reported, except for the provisions of the food law. The following calculation illustrates this point: In San Francisco, there are annually slaughtered about 500,000 pigs. It may be assumed that only 2 per cent of them carry viable trichinellae. If each pig furnishes 100 meals, the imposing number of 1,000,000 trichinellae infested meals are served annually.

It is not the Meat Inspection law which has to undergo fundamental changes, but the hog raising industry. Trichinellae infections of pigs are caused by man-made conditions. Pigs kept exclusively on a vegetable diet are not liable to contract trichinellae. The majority of all pigs raised in the State of California are kept on a grain-

vegetable diet and, so far, such vegetarian fed hogs are free from trichinelliasis. The sources are found in the smaller group of hogs fed on a mixed diet of vegetables and raw or partially cooked meat, including pork, in so-called garbage.

The drive against trichinelliasis in the United States is mainly conducted by cities. Around these, piggeries are being operated, attracted by abundant, excellent, and relatively cheap food supplies. Offal from meat factories, slaughter-houses, scraps from food stores, hotels, first-grade garbage of restaurants, hospitals, military camps, institutions, garbage of railroads, and so on, are collected and utilized without further preparation in these piggeries. This offal probably includes raw pork in varying quantities. Pigs fed with this type of food become infected with trichinellae. Pork and pork food products manufactured from these animals are, in turn, responsible for infection in man. *The main source of trichinelliasis in the United States is the communities themselves offering unsafe foodstuffs for feeding pigs and failing to provide proper regulations to make this dangerous food safe.*

This mistake in policy, made on a large scale in cities, is repeated on a smaller scale in smaller communities. Wherever pigs are fed with scraps of raw pork or pork products, the danger of trichinelliasis in man becomes imminent. Since the days of Zenker, it has been emphasized that trichinelliasis is the result of the incorrect feeding of pigs.

This theory seems to give too little consideration to the rôle of rats in the propagation of the disease. Rats share in the cycle of transmission of trichinellae only in a more passive way. They become victims of the same infected food that is responsible for infection in pigs and in man. The tabu-

lations in this report make such conclusion inevitable. There is, of course, no possible place for rats as vectors and passive transmitters of trichinelliasis to pigs on hog ranches. Each infected rat represents a potential source of trichinelliasis for about 3 consecutive years.

The likelihood of transmission of trichinelliasis to hogs by feeding on carcasses of dogs and cats is undisputed. There has been argument as to whether feces of infected hogs may transmit the disease to other hogs. We feel justified in assuming that no spread of infections by feces is possible from the 3rd day after intake of the infected food. Dogs and cats discharge great numbers of trichinella larvae, seemingly unaltered and undeveloped the 1st, and possibly the 2nd day in the course of the turbulent reaction of the intestine accompanying heavy invasion of the parasite. Possibility of transmission to hogs during the short period of time is quite likely. The justification of keeping dogs and cats on hog ranches for the destruction of rodents is therefore upset by the possible danger of transmission of trichinelliasis to pigs. Rat eradication on hog ranches must not depend on dogs and cats, but on more effective poisoning.

It is not justifiable for departments of health to take over the burden of investigation of every pig in regard to trichinella infection, as by the serologic reactions advocated by Augustine and Spink.⁶ It is contended that the provision of the Meat Inspection law adjusted by the few regulations and suggestions named above, combined with sanitary management of hog ranches, provides sufficient means of dealing effectively with the present trichinella situation. In reality, sanitation of the hog ranches, strictly enforced, would make all other regulations superfluous. Some day, as fore-

shadowed in Hall's¹ summary of the situation, this may become the universal policy. At present the situation is complicated, since only a minor portion of the pork supply of a great community is derived from sources under control.

So far as San Francisco is concerned, trichinella conditions are aggravated by allowing food scraps carrying viable trichinellae to be collected in city limits to serve as hog food, without further preparation on hog ranches. Realizing that in so doing, trichineliasis is artificially propagated in pigs, to be in turn reintroduced into man, this condition can no longer be tolerated. It will become necessary to license the use of city garbage as hog food and to grant licenses only if guarantees are given that no unsafe food is used in these piggeries. To make garbage safe, sterilization of that intended for hogs seems to be required. It was unfortunate that promising negotiations conducted in 1937 between the San Francisco Department of Public Health and the agencies involved have been terminated by labor strikes. Executive Order Number 209, March 15, 1938, solves this problem. Another solution of the question would be the establishment of municipal piggeries, such as some cities have built up, in order to make garbage disposal profitable.⁷ The plant could operate in the beginning with garbage of institutions made safe by proper procedures. Later on at least part of the first-grade garbage of private institutions would be added voluntarily, if the profit of the municipal piggery were used to sustain humanitarian institutions.

Pork from pigs raised on such a piggery would be free from trichinellae, and this could be made certain by adequate inspection. Pork of this type does not at present exist on the American market.

The hog industry should become fully conscious that hog raising and pork producing are not exclusively private enterprises, but that they impose certain obligations in the interest of public health, as it is already acknowledged under similar circumstances in the dairy industry. Pork food producing agencies should try everything to provide a "healthful, wholesome, and safe meat supply" (California Meat Inspection law, section 2), an assurance not fulfilled, so far as trichineliasis is concerned.

Other Executive Orders issued by the San Francisco Department of Public Health for protection against trichineliasis are as follows: Executive Orders Nos. 215 and 216, April 2, 1938; and Executive Order Number 217, April 19, 1938.

Zoölogical gardens are an uncommon, but nevertheless occasionally important, source of trichineliasis. Since San Francisco has such an institution, we mention briefly some general rules:

1. Feeding of raw pork, even scraps of it, in garbage, and of raw dog or cat meat, should be carefully avoided.
2. Carcasses of animals of the zoo, and especially those of flesh-eating animals, should not be buried or used as food for other animals, but should be incinerated.
3. Utilization of the meat of any flesh eating animal, and particularly of bear or badger, for human consumption makes special investigation for absence of trichinellae indispensable.
4. Methods of rat control as used on hog ranches.

SUMMARY

The relative protection intended by the Meat Inspection law against trichineliasis in man has to be made more effective and, in addition, the spread of trichineliasis to pigs prevented by the following means:

1. *Sanitation in management of hog ranches:*
 - a. Licensing garbage feeding under the provisions of rendering garbage safe by technical methods.

- b. Extermination of rats (ratproof buildings, poisoning).
- c. Freeing of hog ranches from cats and dogs.

2. Trade regulations:

- a. Exclusion of pork food products of Group 4 from the market.
 - b. Breakfast sausages should be manufactured from safe pork.
 - c. Limited trichinella inspection for manufactured pork food products is desirable.
 - d. Safe products should carry declaration: Guaranteed Safe, Meat Inspection of Department of Public Health.
 - e. Labels: "Prepared from . . . inspected meat" are not advisable on products of Group 2.
 - f. Clearly visible inscription on sales of pork: *Cook Pork Thoroughly*.
- ## 3. Education of consumer:
- a. In regard to occurrence of trichinellae in food and dangers of raw or undercooked pork and pork food products.
 - b. How to avoid undercooking.

4. Instructions to personnel of eating places—similar to those for consumers:

Mechanical safety devices.

Hamburgers are to be made from beef only.

REFERENCES

1. Hall, M. C. *Studies on Trichinosis*. IV. The Role of the Garbage Fed Hogs in the Production of Human Trichinosis. U. S. Treasury Dept. Public Health Service, 1937.
2. McNaught, James B., and Anderson, Eugene V. The Incidence of Trichinosis in San Francisco. *J.A.M.A.*, 107:1446 (Oct. 31), 1936.
3. Hobmaier, M. Non-Transmissibility of Trichinelliasis in Pig. *Science*, 86, 2241-2242, 1937.
4. Hobmaier, M., and Meyer, K. F. Filter-Method for Clean Isolation of Trichinella larvae. *Science*, 86, 2242-2248, 1937.
5. Schwartz, B. Trichinosis, a Disease Caused by Eating Raw Pork. U. S. Dept. Agric. Leaflet No. 34, 1929.
6. Spink, W. W., and Augustine, D. L. Trichinosis in Boston. *New Eng. J. Med.*, 213, 11-12, 551, 1935.
7. Ashbrook, F. G., and Wilson, A. Feeding Garbage to Hogs. U. S. Dept. Agric. *Farmers Bull.* No. 1133, 1923.

An Epidemic of Typhoid Fever Attributed to Salad Contaminated by a Chronic Typhoid Carrier

PAUL A. LEMBCKE, M.D., AND PAUL VON HAESSELER, M.D.
State Department of Health, Albany, N. Y.

EACH of 3 cases of typhoid fever reported during the third week of June, 1937, in individuals rather widely separated as to residence was investigated independently by the health agency* in whose jurisdiction the case occurred. The New York State Department of Health was notified of the occurrence and result of investigation of each case. Study of the reports revealed the common factor that all 3 individuals had attended a luncheon served on Memorial Day by a fraternal organization in Schenectady.

An immediate survey of recent admissions to Schenectady hospitals was undertaken and disclosed 2 additional cases of illness characterized by continued fever which were suspected of being typhoid fever, the diagnosis of which was subsequently confirmed by laboratory evidence. Both individuals had attended the luncheon on Memorial Day.

The almost simultaneous occurrence of 5 cases of typhoid fever in residents or visitors to Schenectady was a definitely unusual prevalence of the disease, the average annual number of cases in Schenectady for 1932-1936 being 2. The fact that all 5 had at-

tended the Memorial Day luncheon strongly suggested an etiological relationship of some factor connected with the luncheon. A detailed investigation was undertaken jointly by the Schenectady City Department of Health and the New York State Department of Health.

CLINICAL INVESTIGATION

The names and addresses of persons who attended the luncheon were obtained, and each individual was visited by a member of the medical staff of the State Department of Health. In all, 33 persons attended the luncheon and 2 were discovered who did not attend but who ate food brought home from this function. All but 2 of the 35 were interviewed. If the questioning revealed symptoms suspicious of typhoid fever, 3 fecal specimens and one or more of blood were obtained for laboratory examination. In the absence of symptoms a single fecal specimen was secured. Three fecal specimens were obtained from all persons known to have supplied or prepared food for the luncheon.

During the investigation 4 new cases were reported and 4 hitherto unknown cases were discovered, making 13 cases among those who attended the luncheon. The Widal was positive in all 13 cases.

* Schenectady City Department of Health, New York State Department of Health District Office, and Massachusetts State Department of Health.

One patient died before a fecal specimen was obtained; typhoid bacilli were isolated from the feces of 9 of the 12 cases from whom specimens were secured. Typhoid bacilli were cultured from the blood of one patient who had negative fecal cultures. Of the total number, 9 were residents of Schenectady and 4 were non-residents. In addition to the 13 clinical cases, 2 sub-clinical cases or passive typhoid carriers were detected. A positive Widal and positive fecal cultures were obtained from both individuals, although there was no history of previous typhoid fever and neither exhibited the symptoms nor physical signs of the disease. That the carrier condition in these two was of temporary duration was demonstrated by repeated bacteriological studies. A positive Widal was reported in one individual who gave no history of previous typhoid fever or vaccine and who suffered no symptoms of the disease; repeated fecal cultures were negative. With the exception of this person, positive Widal tests were not found in other than the clinical cases and temporary passive carriers of typhoid bacilli.

None of the individuals interviewed had ever received typhoid vaccine. Two gave a history of previous typhoid fever; neither became ill and the laboratory examinations were negative.

CLINICAL CHARACTERISTICS

The clinical course was prolonged and severe in 6 cases, and 1 death occurred; a girl aged 16 years. The other cases were relatively mild; in fact, 4

were not recognized prior to the epidemiological investigation as having typhoid fever. In addition to these 13 clinically recognizable infections, there were the 2 sub-clinical cases or temporary passive carriers, and the 1 individual with a positive Widal, who have been described above.

Three of the 13 cases became chronic carriers, women, aged 44, 53, and 65, respectively. Each has been found to excrete typhoid bacilli in the feces over a period of more than a year following the illness.

INCUBATION PERIOD

The interval between the luncheon and the onset of symptoms varied from 5 to 28 days. The peak incidence was reached on the 7th day, when 5 cases occurred; the median case fell on the 9th day. The chronological distribution of cases is shown in Table I.

FOOD SOURCE

Detailed information was obtained as to the various foods eaten by each individual who attended the luncheon. Table II lists the foods, and shows the consumption of each type by the 15 infected and by the 17 who did not show evidence of infection. Potato salad, macaroni salad, buttered rolls, and coffee were the only foods eaten by more than 5 of the patients.

Of the home prepared foods, 2 persons each supplied one dish of potato salad; 1 person provided two dishes of potato salad, and 1 of macaroni salad; 4 cakes were contributed by different persons; 1 person supplied cabbage

TABLE I

Incubation Period of 13 Clinical Cases of Typhoid Fever Occurring Among Persons Having a Single Exposure to Food Contaminated by a Chronic Typhoid Carrier

Number of Days Following the Luncheon	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	Total
Number of Cases					1		5		2		1				1		1							1				1	13

TABLE II
Infection According to Foods Eaten at Luncheon

Type of Food	Fifteen Infected Persons			Seventeen Persons Not Infected			Number Known to Have Eaten	Number Infected	Infection Rate Among Those Eating
	Number Eating	Number Not Eating	Doubtful	Number Eating	Number Not Eating	Doubtful			
Macaroni Salad	11	3	1	4	11	2	15	11	73
Potato Salad	12	1	2	14	3	0	26	12	46
Buttered Rolls	13	2	0	15	2	0	28	13	46
Coffee	11	4	0	15	2	0	26	11	42
Baked Beans	5	10	0	11	6	0	16	5	31
Summer Sausage	5	10	0	4	13	0	9	5	55
Pickles	5	9	1	6	11	0	11	5	45
Cabbage Salad	4	9	2	5	11	1	9	4	44
Spiced Ham	4	11	0	4	13	0	8	4	50
White Cake	4	11	0	5	12	0	9	4	44
Chocolate Cake	4	11	0	8	9	0	12	4	33

salad; a dish of baked beans was furnished by another, and a jar of pickles was provided by one. The remaining articles—tinned evaporated milk, coffee, sugar, butter, rolls, and cold sliced meats—were purchased from various stores in Schenectady.

Serving spoons were placed in the dishes contributed and each guest helped himself. The only food prepared at the church was the rolls, which were buttered just before the luncheon. Of the 5 women who did this, 4, all of whom were well at the time, subsequently developed typhoid fever; the 5th gave no history of previous typhoid fever; her Widal was negative; and 3 fecal cultures on successive days were negative.

Four of the 10 persons who prepared food at home developed typhoid fever subsequent to the luncheon. The date of onset could be fixed with a considerable degree of certainty in each—first symptoms appeared from 5 to 11 days after the luncheon.

Two of the 6 persons who prepared food and who did not contract typhoid fever gave a history of previous typhoid fever; 3 or more negative fecal cultures were obtained from each. Of the 4 who prepared food but did not develop the disease and who gave no

history of previous typhoid fever, 3 each submitted 3 or more negative fecal specimens. *B. typhosus* was isolated from the feces of the remaining individual on 12 different occasions over 3 months following the luncheon.

The individual with positive fecal cultures, M. T., a woman 65 years of age, denied having had clinically recognized typhoid fever at any time.* She recalled, however, that about 40 years previously, her sister suffered from a disease which was probably typhoid fever, and that, although she was living in the same household, she herself did not become ill. For the past 10 or 15 years, M. T. had suffered symptoms which might be ascribed to chronic cholecystitis. She had never had children, her occupation had never involved the preparation of food for others, and there was no history of her ever having given rise to a case of typhoid fever previous to this epidemic.

Despite the finding of typhoid bacilli in many fecal specimens submitted at intervals over 3 months, and a negative Widal reaction on the 43rd day following the luncheon, the possibility that

* Twenty per cent of known chronic typhoid carriers in New York State deny previous history of typhoid fever.

M. T. was not a typhoid carrier prior to the luncheon but had developed sub-clinical typhoid and the carrier condition subsequent to the luncheon might be raised were it not for the epidemiological evidence incriminating her.

On the evening of May 30, M. T. peeled and boiled potatoes which were set aside until the following day. Early in the morning of the day of the luncheon, the potatoes prepared the previous evening, and a dish of macaroni boiled the same morning, were cut up, celery and a prepared mayonnaise dressing were added, and the ingredients stirred and mixed with the fingers. Two dishes of potato salad and one of macaroni salad were set aside for several hours at room temperature, and shortly before noon taken to the church parlors to be served at the luncheon. A small amount of each salad was left at home for the evening meal.

This was the only macaroni salad served at the luncheon. Eleven of the 15 persons known to have been infected (either clinical cases or passive carriers) gave a definite history of having eaten this salad; one other patient stated she had probably eaten it. Two of the four dishes of potato salad were prepared by M. T. Twelve of the 15 infected persons stated definitely they had eaten potato salad, and 2 others stated they had probably eaten of it. Altogether, 14 of the 15 gave a definite history of having eaten potato salad or macaroni salad, or both; the remaining patient felt it was very probable she had eaten of both.

At the conclusion of the luncheon, some of the potato salad prepared by M. T. remained, was taken home by one of the women present, and served to her son and niece. The son developed typhoid fever on June 25, but the niece was apparently not affected.

A young man who rented a room in the home of M. T. attended the luncheon but denied having eaten either potato or macaroni salad, preferring baked beans, as did the majority of men attending. However, in the evening of the day of the luncheon, he ate in the home of M. T. a portion of the salads which had been left at home since morning. On the basis of a positive blood agglutination test and the presence of typhoid bacilli in a fecal specimen submitted July 4, he has been considered a temporary passive typhoid carrier; several fecal cultures subsequent to that of July 4 have been negative. The remainder of the salad left at home was eaten by M. T. and her husband. The latter suffered from "grippe" and vague intestinal symptoms for 2 or 3 days about 2 weeks after the meal; fecal culture was negative 34 days later, and the Widal test, made 45 days after the meal, was negative.

The fact that macaroni salad prepared by M. T. was eaten by at least 10 of the typhoid fever patients; that potato salad was eaten by at least 11 of the 13, and that M. T. prepared two of the four dishes of potato salad; that 12 and probably all 13 of the patients ate potato salad, macaroni salad, or both; that 2 of the patients ate M. T.'s salad elsewhere than at the luncheon; and that repeated fecal cultures submitted by M. T. over 3 months have contained typhoid bacilli makes it extremely probable that, even in the absence of a history of previous typhoid fever, she was a chronic typhoid carrier and the source of the outbreak. The vehicle of infection was potato salad and macaroni salad prepared by the carrier.

SUMMARY AND CONCLUSIONS

1. Three cases of typhoid fever in individuals rather widely separated as to resi-

dence were reported by 3 different health departments to the New York State Department of Health. Prompt reporting, followed by epidemiological investigation, made possible the early recognition of an outbreak of typhoid fever and the institution of steps to detect the source and prevent its spread. The importance of prompt reporting by physicians and health officers of what may seem to be individual and apparently isolated cases is illustrated by this outbreak.

2. Thirteen clinical cases of typhoid fever were found to have occurred among 35 persons who had eaten food prepared for a community meal to which articles were contributed by 10 different persons.

3. In addition to the 13 clinical cases, 2

temporary passive carriers of typhoid bacilli were detected by routine laboratory examination. An additional person was found to have a positive Widal in the absence of symptoms and history of typhoid fever or vaccine; fecal cultures were negative.

4. Three of the clinical cases were found to have passed from the acute stage into the chronic typhoid carrier condition. All 3 continue to excrete typhoid bacilli for more than a year after the onset of typhoid fever.

5. No secondary cases occurred as a result of the epidemic.

6. Detailed epidemiological studies identified the vehicle of infection as macaroni and potato salads, and the source as a previously unrecognized chronic fecal typhoid carrier.

Yellow Fever in Brazil

AS to the general situation in regard to yellow fever in South America the observations of the last 3 months show in a striking way the importance of jungle fever as a public hygienic problem of the first order. An enormous area covering parts of the States of Minas Geraes and Rio-de-Janeiro have been infected during this year (1938). The value of viscerotomy has been again shown. All of the early cases of the present epidemic have been discovered by viscerotomy, although many of the physicians of this region were familiar with the literature concerning jungle fever.

The present outbreak in the States of Minas Geraes, Rio-de-Janeiro, and Sao Paulo have been associated as have been those in recent years in Brazil with a high mortality in howler monkeys. This

observation has been confirmed by the discovery of dead monkeys in the forest. The result of many thousands of protection tests with the serum of wild animals begun in 1934, confirm the opinion that the various varieties of monkeys are the most important vertebrates in the dissemination of the jungle virus. The collection of insects in the many infected zones also confirm the idea that several species of mosquitoes are the active vectors of the virus when most of the human cases are produced. However, it has not yet been possible to determine the method by which the virus is concerned from season to season in the south of Brazil where each year a number of months pass without a single human case being observed.—F. L. Soper, *Month. Bull.*, Office International d'Hygiène Publique, June, 1938, p. 1205.

Dye Concentration in Culture Media Employed for the Analysis of *Escherichia-Aerobacter* Members in Milk*

HERBERT D. MCAULIFFE AND M. A. FARRELL

*Division of Bacteriology, The Pennsylvania State College,
State College, Pa.*

RECENT investigations¹ have indicated that one of the limiting factors in tests to determine the presence of *Escherichia-Aerobacter* members in milk has been the culture media employed. In most instances the concentration of the bacteriostatic agents in these media was developed for use in water analysis. Assuming the possibility of most of the dyes used as bacteriostatic agents being adsorbed on the milk solids, leaving only a fraction of the original concentration free for inhibitory purposes, studies were undertaken to determine a more desirable dye concentration for culture media employed in the detection of the *Escherichia-Aerobacter* group of organisms in milk.†

In view of the earlier results obtained in this laboratory¹ which indicated that fuchsin lactose broth, brilliant green lactose bile broth 2.0 per cent, and methylene blue brom cresol purple broth were equally efficient in the de-

tection of *Escherichia-Aerobacter* members in milk, the media selected for this study were fuchsin lactose broth and brilliant green lactose bile broth 2.0 per cent. The third medium was omitted because of its relative complexity.

*Standard Methods of Water Analysis*² recommends a concentration of 1 part of 95 per cent basic fuchsin dye in 66,666 parts of lactose broth. In this study it was verified that an increase in the basic fuchsin dye content above that recommended was inhibitory to the growth of aqueous suspensions of colon group members. However, skim milk suspensions of the same organisms were not inhibited by a basic fuchsin ‡ dye concentration of 1 part in 13,300 of lactose broth.

These results with skim milk failed to take into consideration the possibility of dye being adsorbed on the fat globules of whole milk. Further studies were undertaken, therefore, employing whole milk of varying percentages of fat and serum solids, to determine the concentration of dye necessary in the

* Authorized for publication on June 20, 1933, as paper No. 840 in the Journal Series of the Pennsylvania Agricultural Experiment Station.

† Studies not here reported show that Gram-positive organisms multiply readily in these media with their present dye content in the presence of the organic materials of whole milk.

‡ The dye content of the basic fuchsin and brilliant green dyes employed in this study was 35 and 95 per cent respectively and was approved as satisfactory by the Commission on Standardization of Biological Stains.

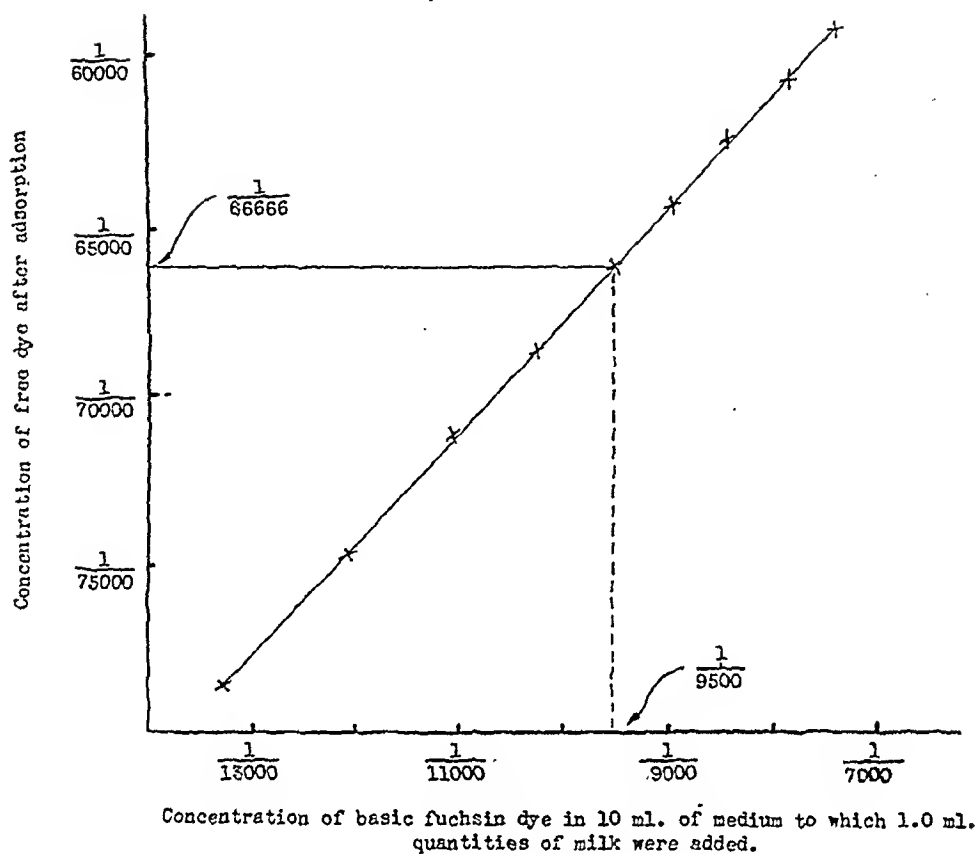


Figure I

presence of whole milk which would permit a free dye concentration of 1 part in 66,666, as recommended by *Standard Methods of Water Analysis*.²

Whole milk containing 4.0 per cent fat and 8.0 per cent serum solids was added to lots of lactose broth of varying dye content in a ratio of 1 part milk to 10 of the medium. The concentration of free dye present after adsorption was determined by placing the mixture inside a semi-permeable membrane and allowing the dye to dialyze for 48 hours at 37° C. into a standard medium containing 1 part dye in 66,666 parts of lactose broth. A free dye concentration less than the standard resulted in a movement of dye inward and decreased the dye concentration outside of the membrane. Conversely a con-

centration greater than the standard resulted in an increased concentration of dye outside of the membrane. Only when the free dye concentration of the milk and medium mixture was equal to the standard of 1 part in 66,666 was there no change in the concentration of dye outside of the membrane.*

Figure I shows that, as the concentration of dye mixed with the milk was increased, the concentration of free dye after adsorption also increased to plot as a straight line. When the concentration of dye in the medium mixed with the milk was increased to 1 part in 9,500 (see broken line), the free dye content was approximately 1 part

* All dye concentrations after dialysis were determined colorimetrically.

in 66,666 as noted by the horizontal line. In order to have a free dye concentration of 1 part in 66,666 as recommended² in the presence of whole milk, 4.0 per cent fat and 8.0 per cent serum solids, it is necessary to have a concentration of 1 part in 9,500 in the medium before adding the milk.

Similar studies were conducted employing a milk abnormally high in organic matter, 6.0 per cent fat and 12.0 per cent serum solids. It was found necessary to increase the dye concentration to 1 part in 8,250 to give a free dye concentration at 1 part in 66,666. Conversely a low solids milk 3.0 per cent fat and 6.0 per cent serum solids required a dye concentration of only 1 part in 14,800.

*Standard Methods of Milk Analysis*³ recommends the use of brilliant green lactose bile broth 2.0 per cent as a presumptive medium in the detection of *Escherichia-Aerobacter* members in milk. The concentration of brilliant green is the same as recommended by *Standard Methods of Water Analysis*,² 1 part of certified brilliant green in 75,188 parts of lactose bile broth 2.0 per cent. The optimum concentration of brilliant green in brilliant green lactose bile broth 2.0 per cent for use in detecting *Escherichia-Aerobacter* members in milk was determined by dialysis as previously described. Results indicate that a concentration of 1 part of brilliant green in 30,000 is necessary in the medium to obtain the recommended concentration in 75,188 for bacteriostatic action in the presence of whole milk solids, 4.0 per cent fat and 8.0 per cent serum solids.

A comparison was then made to observe the relative efficiency of 4 culture media in the detection of *Escherichia-Aerobacter* members in the presence of whole milk solids. Two of these media contained the concentration of dye recommended in *Standard Methods* and in the remaining 2 the concentration

that was found in this study to be more favorable. These media are:

1. Fuchsin lactose broth, 1 part basic fuchsin in 66,666
2. Fuchsin lactose broth, 1 part basic fuchsin in 9,500
3. Brilliant green lactose bile broth 2.0 per cent, 1 part brilliant green in 75,188
4. Brilliant green lactose bile broth 2.0 per cent, 1 part brilliant green in 30,000.

These media were inoculated with 5 pure cultures of the colon group suspended in coli-free whole milk in various dilutions. Five tubes of each medium were inoculated with 1 ml. of each dilution of each culture. The tubes were incubated 48 hours and positive tubes recorded on the basis of gas production. The medium containing 1 part basic fuchsin in 66,666 gave 154 positive tubes, while the medium with 1 part in 9,500 gave 161, showing that the increased concentration of dye gives a more efficient medium. Both 1 part in 75,188 and 1 part in 30,000 brilliant green gave 155 positive tubes, indicating that the increased concentration is just as efficient for *Escherichia-Aerobacter* members as the lower.

To determine the relative efficiency of the 4 media in inhibiting false presumptive organisms in the presence of whole milk solids, the same procedure was followed, using 2 cultures of the genus *Bacillus* capable of fermenting lactose with the production of gas. In this case, 1 part in 66,666 basic fuchsin gave 52 positive tubes, while 1 part in 9,500 gave only 6 positive tubes and 34 with small bubbles, showing that the increased concentration of basic fuchsin is more inhibitive to these microorganisms which are responsible for false presumptive tests. One part in 75,000 brilliant green gave 2 positive tubes and 18 showing small bubbles, while 1 part in 30,000 gave no positive tubes and no bubbles, again showing the increased dye concentration to be

more inhibitive to these Gram-positive lactose fermenting organisms.

The ability of these 4 media to serve as selective media in the detection of *Escherichia-Aerobacter* organisms in milk samples containing several types of bacteria was studied by inoculating them with 70 milk samples collected at a local receiving station. Five tubes of each medium were inoculated with 1 ml. portions of milk and positive tubes confirmed with regard to the presence of *Escherichia-Aerobacter* members by employing eosine-methylene-blue and making the "completed test" in accordance with "Standard Methods Procedure."²

The medium containing 1 part in 9,500 basic fuchsin when used as a presumptive medium showed that 53 of the 70 samples contained *Escherichia-Aerobacter* members, all of which were confirmed and found positive on completion. The medium containing the lower concentration of basic fuchsin, 1 part in 66,666, revealed only 43 of the 53 positive samples as containing colon group members. The brilliant green lactose bile broth 2.0 per cent medium with 1 part in 75,188 brilliant green detected only 46 samples showing *Escherichia-Aerobacter* members, compared to the medium containing 1 part in 30,000 brilliant green, which showed 51 positive samples. These results indicate that the increased concentrations of dye are more sensitive in detecting *Escherichia-Aerobacter* members in milk.

The higher concentrations of basic fuchsin and brilliant green in no case permitted the growth of false presumptive microorganisms. However, with both dyes the lower concentrations showed gas from 5 samples, which could not be confirmed as being positive on completion; again indicating that the increased concentration of dye is more effective in inhibiting the growth of non-colon group microorganisms.

DISCUSSION

The results obtained in this study indicate that in the employment of these "Presumptive Tests" media for the detection of *Escherichia-Aerobacter* members in milk, the milk solids adsorb a considerable amount of the dye present. The proportion of dye in these two media was originally determined by incorporating the (greatest) maximum dye content to serve as a bacteriostatic agent for Gram-positive bacteria which at the same time would not inhibit the growth of Gram-negative organisms. In the case of fuchsin lactose broth the maximum amount of dye which could be incorporated was 1 part in 66,666. These studies show that when 1 ml. portions of whole milk (4.0 per cent fat, 12.0 per cent total solids) were added to fuchsin lactose broth, the dye concentration could be increased approximately 7 times to a concentration of 1 part in 9,500 without inhibiting the growth of colon group members. In a similar manner it was demonstrated that the content of brilliant green in brilliant green lactose bile broth 2.0 per cent could be increased approximately 2½ times, or from a concentration of 1 part in 75,188 to 1 part in 30,000.

As a result of the adsorption of fuchsin dye upon the milk solids there is less dye present to act as an inhibitory agent and Gram-positive organisms multiply readily in fuchsin lactose broth with its present dye content. Previous studies (1) indicated that these 2 culture media when used for the detection of *Escherichia-Aerobacter* members in milk gave 20 per cent of false presumptive tests. The present study, employing pure cultures of bacteria as well as 70 milk samples, shows that by increasing the dye content in these 2 media the false presumptive tests are largely eliminated without lessening the selective properties of these media for the *Escherichia-Aerobacter* group.

SUMMARY

1. The addition of 1 ml. portions of milk to fuchsin lactose broth and brilliant green lactose bile broth 2.0 per cent adsorbed a considerable amount of the dyes present, thereby lessening the selective action of these media in the detection of the *Escherichia-Aerobacter* group of organisms in milk.

2. To obtain the proper amount of free dye so that these culture media can serve in a selective capacity it is necessary that the content of basic fuchsin in fuchsin lactose broth be increased approximately 7 times, from 1 part in 66,666 to 1 part in 9,500, and the con-

tent of brilliant green dye in brilliant green lactose bile broth 2.0 per cent be increased approximately $2\frac{1}{2}$ times from 1 part in 75,188 to 1 part in 30,000.

REFERENCES

1. Farrell, M. A. A Comparison of Ten Presumptive Test Media Used in the Detection of the *Escherichia-Aerobacter* Group in Milk. *J. Dairy Sci.*, 20:67-75, 1937.
2. *Standard Methods of Water Analysis*, 8th ed. American Public Health Association, 50 West 50th Street, New York, N. Y., 1936.
3. *Standard Methods of Milk Analysis*, 6th ed. American Public Health Association, 50 West 50th Street, New York, N. Y., 1934.

Medical Research in Canada

SCIENCE announces that a survey of existing facilities for medical research in Canada is to be made under the auspices of the Committee on Medical Research, established in March, 1938, by the National Research Council. Sir Frederick Banting is chairman of the committee and will personally conduct the survey.

Among other members of the committee are those with special interest in public health including Dr. R. E. Wodehouse, Deputy Minister, Department of Pensions and National Health, Ottawa, and Dr. A. Grant Fleming, Dean of the Faculty of Medicine and Professor of Public Health, McGill University, Montreal.

Bovine Mastitis

The Relation of Streptococci to Physical Changes Occurring in the Udders of Dairy Cows

W. T. MILLER AND H. W. JOHNSON

*Bureau of Animal Industry, U. S. Department of Agriculture,
Beltsville, Md.*

THE anatomical changes which develop in the bovine udder as a result of mastitis offer one of the most satisfactory means available at the present time of determining whether the organ is diseased and how far the disease has progressed. When mastitis has been present in a quarter for even a relatively short time the character of the udder tissue becomes appreciably altered. The changes which are found on clinical examination of a diseased quarter may be either in the form of distinct firm nodules or diffuse thickening of the glandular tissue. The lesion in either case represents an invasion of the normal secreting tissue by connective or scar tissue following inflammation of the gland. If the mastitis is only transient in nature, the proliferative process becomes static, but the indurations remain as a permanent record of the attack. Unfortunately, the majority of the cases of mastitis are caused by bacterial invasion, and as a rule the infection establishes itself permanently in the udder. In this event, the disease tends to progress with varying degrees of rapidity from the original site of localization, usually the cistern, to the rest of the quarter. Induration of the glandular tissue accompanies this progression until in

many cases there is practically a complete replacement of the secreting tissue by scar tissue.

In view of the permanence of the changes which occur as a result of mastitis and its accessibility for examination, palpation of the empty udder affords an easy and accurate means of detection of the disease. Some of the possibilities inherent in this method have been recognized in the past by a number of authors¹⁵ and Udall and Johnson²⁰ have observed that "the value of a physical examination in diagnosis (of mastitis) rates above any other single method." That the milk from udders which are definitely indurated is usually changed in composition as shown by other tests; such as pH, chlorine, catalase and leucocyte count, has been observed in the course of mastitis investigations in this laboratory and this fact has also been reported by Hucker and Udall.¹⁰ On the other hand, when milk samples from these udders are examined bacteriologically, bacteria which are not customarily associated with mastitis are not infrequently found. Also a few udders have been encountered which appear to be entirely normal on palpation and are harboring mastitis streptococci.

As a result of the rather extensive investigation of mastitis by a number of workers in the past, a number of species of bacteria have been described as the causative agents of the disease. It is fairly well agreed at the present time, however, that the streptococci are of chief importance in this respect and that one definite species, *Streptococcus agalactiae*, is found in a high percentage of the cases of this type of mastitis. The incidence frequently reported for this species has been around 90 per cent.^{8, 17} Several species of streptococci comprise the remaining 10 per cent, but probably because of their relatively infrequent occurrence, the information concerning them is somewhat limited. Other species of cocci, more particularly staphylococci are also found in some cases of mastitis, but comparatively little knowledge is available relative to their importance in the disease. More recently however, reports^{5, 6, 11, 12, 18} have appeared which indicate an increasing interest in this phase of the problem. The remaining bacterial species, consisting principally of bacilli, such as coliform types, *Corynebacterium pyogenes*, and others, are of minor importance probably because of the sporadic character of their occurrence. It is worthy of note in this connection that the changes induced by these various agents in the udder and the milk are very similar.

The object of this work therefore was to compare the physical condition of the udders of infected and uninfected cows in herds in which mastitis streptococci were present and also to compare the udders of cows in streptococcus-free herds with these animals. In addition an attempt was made to identify the species of streptococcus in each animal so infected. Several different types of herds in the vicinity of Beltsville, Md., were included in the investigation which was started in the fall of 1936. Three of these herds,

numbers 1, 2, and 9 (Tables II and V) are maintained to supply fluid milk to institutions. Two other herds, numbers 3 and 5, are used principally for experimentation in breeding and feeding problems of dairy cattle. The remaining four herds, numbers 4, 6, 7, and 8, are privately owned and are subject to health department supervision. In addition to milk production, herd number 4 is used for breeding pure bred cattle.

PROCEDURE

Composite samples of milk were collected from each animal immediately before milking. The ends of the teats were washed thoroughly with a pledget of cotton, moistened with a 1 in 1,000 solution of bichloride of mercury in 50 per cent alcohol. Several streams of milk were discarded from each quarter and then as equal amounts as possible were drawn from the four quarters into a sterile screw top specimen vial, holding about 20 c.c. When the samples were brought to the laboratory, part of the milk was immediately tested by the Hotis method,⁹ and the remainder was incubated for 24 hours at 37° C. in the original container. At the end of this time, the results of the Hotis test were noted and smears made from the incubated milk for microscopic examination. In addition a large loopful (4 mm. loop) of incubated milk was spread over the surface of a blood agar plate (5 per cent horse blood) which had been prepared previously. The plates were incubated for 24 hours at 37° C. and the colonies which resembled streptococci were picked into 10 per cent serum (horse) bouillon. These cultures were examined microscopically for purity following incubation and then seeded in differential culture media.

One-tenth c.c. of culture was added to each of the following media: litmus milk, methylene blue milk (1 in

10,000), lactose, salicin, mannite, trehalose, sorbitol, aesculin, and sodium hippurate. The media for the fermentation tests were made by adding 1 per cent of the carbohydrate to extract broth together with 10 per cent serum (horse) and Andrade's indicator. The solution was adjusted to pH 7.4, sterilized by filtration, and tubed in 2 c.c. amounts. Each medium was incubated for 48 hours at 37° C., to test for sterility. The sodium hippurate medium was prepared according to the pepsin-peptone formula recommended by Ayers and Rupp.¹ Ability to split aesculin was determined by the method described by Weatherall and Dible.²¹ The reactions of the streptococci in these test substances were recorded after 5 days' incubation at 37° C. All of those cultures which failed to give typical reactions for *S. agalactiae* (group A, Table I) were tested a

second time after an interval of several months as a check on the results noted at the time of isolation.

Each udder was examined clinically as soon as possible after it had been milked out. Classification of the udders follows the plan described by Udall and Johnson²⁰ in so far as the physical condition of the organ is concerned. The brom-thymol-blue test was not used and the previous history of the animal was not considered. In this classification, a cow is placed in Class 1 when all quarters are entirely normal and free of indurations. When one or more quarters have some slight change in the consistence of the glandular tissue which may be in the form of a minimum diffuse or nodular thickening, usually in the lower part of the gland, the cow is placed in Class 2. If one or more quarters of the udder contain distinct indurated

TABLE I

Types of Streptococci Isolated from Milk Samples Collected in 5 Streptococcus-infected Herds

Culture	Litmus Milk			M.B. Milk		Lactose	Salicin	Mannite	Aesculin	Sodium Hippurate	Herd Number					Total Cultures
	A	C	R	C	R						1	2	3	4	5	
				Trehalose +							Sorbitol —					
A	+	+	P or —	—	—	+	+ or —	—	—	+	21	105	41	24	0	191
B	+	—	—	—	+	+	—	+	+	+	1	1	0	0	0	2
C	+	+	P	+	+	+	+	+	+	+ or —	3	2	0	0	0	5
				Trehalose +							Sorbitol +					
D	+	+	S or —	+	+	+	+	+	+	+	16	1	2	0	0	19
E	+	+ or —	+ or —	+ or —	+ or —	+	+	+ or —	—	+	6	2	1	4	1	14
F	+	—	—	+ or —	P or —	+	—	—	—	+	6	0	0	0	0	6
				Trehalose —							Sorbitol —					
G	+	+	S or —	—	—	+	+	S or —	—	+	32	0	0	0	7	39

* Methylene blue milk
+ = Positive A = Acid R = Reduction C = Coagulation
P = Partial S = Slight — = Negative

areas either diffuse or as nodules, but with a considerable part of the glandular tissue remaining intact, the cow is classed as number 3. A cow is considered to be in Class 4 when a major portion of the secreting tissue has been replaced by connective or scar tissue.

RESULTS

A total of 629 lactating cows in 9 dairy herds have been examined in the course of this investigation. Streptococcic mastitis was found in 5 herds, containing 547 animals (Table II) while no streptococci were detected in the remaining 4 herds with 82 cows (Table V). The number of cows found to be excreting streptococci with the milk by one or more of the tests was 298, or 47.4 per cent of all animals examined. This result is more or less comparable to those reported by other authors.¹⁵ The highest incidence of infection occurred in the largest herds, numbers 1 and 2, with percentages of 63.1 and 61.0 respectively (Table II), while the lowest percentage, aside from herds which were completely free and which might be considered in another category, was 32.0 in herd 5 with only 25 animals. Herds 3 and 4 had been found to have a somewhat larger num-

ber of animals infected at the time of previous examinations, but owing to disposal of older animals and their replacement with heifers, the incidence of infection has been materially reduced, particularly in Herd 4.

Of the 298 samples (Table II) in which streptococci were detected by one or more of the tests, cultures were recovered from 276, or 90.2 per cent. The different types of streptococci which were isolated have been divided into three large groups (Table I) on the basis of their action on sorbitol and trehalose² and these groups further sub-divided with respect to the results in the other media employed. As a consequence, 7 more or less distinct types have been formed. Because of certain differences in the composition and kinds of media used, it is somewhat difficult to compare the results of other authors in connection with the bacteriology of the streptococci. However, there can be relatively little doubt that Group A in Table I is *S. agalactiae* which has been described under that name by some authors^{7, 19} and Group 1 A¹⁶ and Group 1⁴ by others. On the other hand, the similarity of the remaining strains found in this work with those reported elsewhere is not as

TABLE II

Incidence of Streptococcus Agalactiae and Other Types of Streptococci in 5 Dairy Herds

Herd Number	Number of Milking Cows in Herd	Number of Streptococcus Infected Cows	Per cent of Streptococcus Infected Cows	Number of Cows Carrying <i>S. agalactiae</i> ³	Per cent of Cows Carrying <i>S. agalactiae</i>	Number of Cows Carrying Other Types of Streptococci ⁴	Per Cent of Infected Cows Carrying Other Types of Streptococci
1	141	89 ¹	63.1	53	62.3	32	37.7
2	190	116 ²	61.0	105	94.4	6	5.6
3	88	44	50.0	41	93.2	3	6.8
4 ⁶	103	41 ²	39.8	24	58.7	4	14.3
5	25	8	32.0	7	87.5	1	12.5
Totals	547	298	54.5	230	82.6	46	16.9

1. Streptococci were not isolated from 4 samples of milk.

2. " " " " 5 " " "

3. " " " " 13 " " "

4. 7 strains of this group typical of *S. agalactiae* other than fermentation of both trehalose and sorbitol.

5. 30 strains failed to ferment trehalose.

6. Large percentage of first-calf heifers.

clear. As far as can be determined, Groups B, C, and F have not been reported in other publications dealing with this subject. Group D appears similar in many respects to *S. uberis* described by Diernhofer³ which is listed as Group 3 in the classification of Plastridge and his associates.¹⁶ Group E likewise may be said to resemble Group III of Edwards.⁴ Failure by Group G strains to acidify trehalose is the only cultural difference between them and Group A. Inasmuch as approximately half of the cultures in Group G showed definite evidence of fermentation of trehalose when tested a second time several months after isolation, some question might be raised concerning their inclusion in a separate group rather than placing them in Group A. The irregularity of trehalose fermentation has also been noted by Plastridge *et al.*¹⁶ who have, however, given similar strains a separate classification. It will be observed in Table I that Group G strains have been found in but 2 of the 5 infected herds, numbers 1 and 5 (Table I). In the former, 56.1 per cent of the streptococcus cultures isolated belonged in this group, whereas in the latter herd all but one animal were found to be carrying this strain. In Table II, animals carrying Group G streptococci have been included with those carrying typical *S. agalactiae* or Group A types for convenience in tabulation.

The results of physical examination

of the udders of 617 cows appear in Table III. Twelve additional animals were not examined because of too recent freshening and an accompanying edema of the udder which rendered the organ unsuitable for palpation. The figures presented in Table III are instructive with respect to the influence of streptococci on the udder and also as to the condition of the udders of cows which are not so infected. Although the total number of animals in each group is approximately equal, 2.4 per cent of the infected animals had udders in which no indurations were found and were placed in Class 1 while 11.6 per cent of the uninfected animals fell in this class, a difference of almost 5 to 1. There were 18.2 per cent of the infected animals in Class 2 and 29.4 per cent of uninfected animals which is a ratio of not quite 2 to 1. No significant difference was apparent between the percentage of animals in the two groups found to be in Class 3, although a slight advantage was noted for the uninfected group. In Class 4, however, the difference is considerable in that 24.7 per cent of the infected cows showed marked physical evidence of mastitis in one or more quarters as contrasted with 9.2 per cent for the uninfected group, or about two and one-half times as many. The fact that the percentage of cows in the two groups not infected with streptococci is nearly the same in all 4 classes would appear to emphasize the damaging

TABLE III

Summary of Average Results of Classification of Udders of Cows in the Several Herds by Physical Examination

Group	Total Number of Cows	Class 1		Class 2		Class 3		Class 4	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Streptococcus-infected cows	291	7	2.4	53	18.2	159	54.6	72	24.7
Uninfected cows in all herds	326	38	11.6	96	29.4	162	49.7	30	9.2
Uninfected cows in streptococcus-infected herds	244	28	11.5	74	30.3	120	49.1	22	9.0
Cows in streptococcus-free herds	82	10	12.3	22	26.8	42	51.2	8	9.7
All cows examined	617	45	7.3	149	24.1	321	52.0	102	16.5

TABLE IV

Classification of Udders of Cows in Streptococcus-Infected Herds by Physical Examination

Herd Number	Number of Milking Cows in Herd	Class 1		Class 2		Class 3		Class 4	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1	136 ¹	8	5.9	31	22.8	81	59.5	16	11.7
2	183 ²	17	9.3	33	18.0	89	48.7	44	24.0
3	88	6	6.8	26	29.5	39	44.3	17	19.3
4	103	2	1.9	31	30.0	55	53.4	15	14.5
5	25	5	12.0	5	20.0	16	64.0	1	4.0
Totals	535	36	6.7	126	23.5	280	52.3	93	17.4

1. Five additional cows not palpated

2. Seven additional cows not palpated

effect of these organisms and may also possibly indicate some other common cause for the fibrosis present in non-streptococcus udders.

The physical condition of the udders found in the different herds is shown in Tables IV and V. Although there is considerable variation in this respect in both groups, it will be noted that when individual herds are considered, the uninfected ones do not show the amount of change in the udders found in those which are affected with streptococcic mastitis. It should also be pointed out that the largest number of Class 4 cows occurred in Herd 2 which was also found to have the highest incidence of infection with *S. agalactiae*, 94.4 per cent (Table II), and that as the number of animals carrying these streptococci decreases in the first 4 herds, the number of cows in Class 4 becomes smaller. Under the circumstances, it would appear that this result, although interesting, may be more or less co-

incidental since the percentages in the other classes do not support it.

Because of the comparatively small number of animals in the 4 herds in which streptococci were not found, considerable fluctuation appears in the individual herd percentages. Inasmuch as no definite cause could be determined for the changes present in these herds, it may be possible that local conditions were of considerable influence in this matter. In Herd 9, as an example, several animals with udders showing marked evidence of mastitis and also carrying streptococci had been eliminated several years prior to this survey and replacements made with first-calf heifers from the herd. However, the percentages for these herds are in fairly close agreement with the uninfected cows (Group B, Table VI) in the infected herds. In Table VI, the physical condition of the udders in the infected (A) and uninfected (B) groups in the same herd are compared.

TABLE V

Classification of Udders of Cows in Streptococcus-Free Herds by Physical Examination

Herd Number	Number of Milking Cows in Herd	Class 1		Class 2		Class 3		Class 4	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
6	17	2	11.8	3	17.6	6	35.3	6	35.3
7	34	4	11.8	11	32.4	14	41.2	5	14.7
8	8	0	0.0	2	25.0	3	37.5	3	37.5
9	23	4	17.4	4	17.4	13	56.5	2	8.7
Totals	82	10	12.2	20	24.4	36	43.9	16	19.5

TABLE VI

Comparative Results of the Classification of Udders of Infected* and Uninfected Cows in Streptococcus-infected Herds

Herd Number	Group	Total No. of Cows	Class 1		Class 2		Class 3		Class 4	
			No. of Cows	Per cent	No. of Cows	Per cent	No. of Cows	Per cent	No. of Cows	Per cent
1	A	86 ¹	2	2.3	17	19.8	54	62.8	13	15.6
	B	50 ²	6	12.0	14	28.0	27	54.0	3	6.0
2	A	112 ³	4	3.6	18	16.1	53	47.3	37	33.0
	B	71 ¹	7	16.9	16	22.7	35	49.2	8	11.2
3	A	44	1	2.3	11	25.0	20	45.4	12	27.2
	B	44	5	11.5	15	34.0	19	43.1	5	11.5
4	A	41	0	0.0	6	14.5	25	60.9	10	24.3
	B	62	2	3.2	25	40.3	30	48.4	5	8.1
5	A	8	0	0.0	1	12.5	7	87.0	0	0.0
	B	17	3	17.6	4	23.5	9	52.9	1	5.9

A = Infected animals

B = Uninfected animals

* Cows included from which streptococci were not isolated

1. 3 additional cows not palpated

3. 4 additional cows not palpated.

2. 2 additional cows not palpated

4. 3 additional cows not palpated

Since all of the animals in each herd are maintained under the same conditions the results in this table are of considerable significance. The percentage of uninfected cows in Classes 1 and 2 is uniformly higher by a large margin, while the number of streptococcus-infected cows in Class 4 is two to three times that of the uninfected animals. It may be possible that the somewhat closer agreement between the uninfected animals in the different herds with regard to class percentage may be attributed to the larger numbers in each herd.

DISCUSSION

The results of the bacteriological study of milk samples in this investigation agree fairly well with the reports of other workers.¹⁵ Figures somewhat higher than the 47.4 per cent infection with streptococci have been found in some cases while in others the percentage has been lower. Also the number of cows, 83.3 per cent carrying *S. agalactiae* in one or more quarters

approaches the previously mentioned figure of 90.0 per cent. This slightly lower percentage is due to the findings in one herd (number 1, Table II). If this herd is not considered, the percentage becomes 92.6. A number of types of streptococci were encountered in Herd 1, Table I, most of which have been described by other authors. The type of streptococcus most prevalent in this herd, however, resembled *S. agalactiae* in all respects with the exception of its failure to act on trehalose (Group G, Table I). This same variety was also practically the only one present in Herd 5 (Table I). Although it seems probable that these streptococci may be *S. agalactiae* or closely related to it, it is of interest to note that the percentage of cows with Class 4 udders in these herds is appreciably smaller than in those herds having a high percentage of cows infected with typical *S. agalactiae*.

Very few figures are available with which the results of the clinical examination of the udder can be directly

compared. It is therefore not known whether the figures of 7.3 per cent, Class 1, or normal udders; 24.1 per cent, Class 2, or slightly indurated udders; 52 per cent, Class 3, or distinctly indurated udders; and 16.5 per cent, Class 4, or udders with marked induration would be approximated in an examination of an equal number of cows elsewhere. In connection with the percentage of Class 4 animals, however, some figures reported by the Bureau of Animal Industry^{13, 14} several years ago are of interest. At this time 235,354 milk cows were examined for marked physical evidence of mastitis, and 28,439, or 12.0 per cent, were removed on this account, while 4,760 additional cows were regarded as being suspicious. In the milk shed of one of the larger cites, 64,041 cows were examined and 9,027, or 14.1 per cent, were found to have marked physical cases of mastitis. In view of these results it would appear that the percentage of cows in Class 4 found here could hardly be considered abnormally high. If a similar agreement should extend to the other three classifications, then it might be said that roughly 10 per cent of the cows in milk production have normal udders, 25 per cent have reasonably good udders, while 50 per cent show definite evidence of mastitis, and finally 15 per cent or 1 out of every 6.5 animals are no longer suitable for dairy purposes.

That the streptococci are responsible for the larger portion of the indurations found in these udders seems to be clearly demonstrated by this work, but it is also equally evident that even if the streptococci were eliminated a certain amount of mastitis would still be present in the herd. These same facts are also of importance with regard to the value of clinical examination of the udder in the detection of mastitis. Cows which have or have had mastitis, irrespective of the cause, for any ap-

preciable length of time can be detected by this method with remarkable consistency, and in addition this method is extremely useful in selecting animals which should be removed from the herd on account of badly diseased udders.

SUMMARY

Milk samples from 629 cows in 9 dairy herds were examined by 3 bacteriological methods for the presence of streptococci. The 3 methods used were the Hotis test, microscopic examination of incubated milk, and culture of incubated milk on blood agar plates. When streptococci were found on the blood agar plates, they were tested in differential media and placed in groups according to their action on these media.

Streptococci were detected in milk samples from 298, or 47.4 per cent of all animals examined. These animals, however, were present in only 5 herds. No streptococcus infected cows were found in 4 herds with a total of 82 animals. The highest incidence of infection occurred in the largest herds, and the lowest in the smallest of the 5 herds.

Although streptococci were detected in 298 milk samples by the 3 tests, cultures were recovered from 276, or 90.2 per cent. From their action on trehalose and sorbitol, these strains were divided into 3 large groups and further divided into sub-groups on the results on the other media. Seven groups were found. Group A, or *S. agalactiae*, predominated, and when Group G, which differed from it only in the latter's failure to acidify trehalose, is included, formed 83.3 per cent of the cultures isolated. About one-half of the Group G strains fermented trehalose when tested a second time several months later.

The udders of 617 cows were examined by palpation for indurations as

soon as possible after they were milked out. On the basis of physical condition 45, or 7.3 per cent, of the animals were placed in Class 1, or free of indurations; 149, or 24.1 per cent, were in Class 2 with slight indurative changes; 321, or 52.0 per cent, were definitely indurated and placed in Class 3; and 102, or 16.5 per cent, showed marked physical evidence of mastitis, and belonged in Class 4.

There were 291 cows infected with streptococci as compared with 326 in which these organisms could not be detected. Of the infected animals 7, or 2.4 per cent, of the udders were in Class 1, while 38, or 11.6 per cent, of the uninfected cows fell in this group; a difference of about 5 to 1. In Class 2 there were 53, or 18.2 per cent, of infected cows and 96, or 29.4 per cent, of uninfected cows, a ratio of not quite 2 to 1. There was no significant difference in Class 3 between the two groups, but in Class 4 there were 72, or 24.7 per cent, infected cows against 30, or 9.2 per cent, uninfected, or about two and one-half times as many as the former.

REFERENCES

1. Ayers, S. H., and Rupp, P. Differentiation of Hemolytic Streptococci from Human and Bovine Sources by the Hydrolysis of Sodium Hippurate. *J. Infect. Dis.*, 30:388, 1922.
2. Brown, J. H. Significance of Hemolytic Streptococci Found in Milk. *Cornell Vet.*, 27, 110, 1937.
3. Diernhofer, K. Untersuchungen über die "Streptokokkenmastitis" des Rindes. *Arch. f. Tbk.*, 61, 181, 1930.
4. Edwards, S. J. Studies on Bovine Mastitis.
5. Gwatkin, R. Further Observations on Staphylococcal Infections of the Bovine Udder. *Canad. Pub. Health J.*, 28:34, 1937.
6. Gwatkin, R., Hadwin, S., and LeGard, H. M. Staphylococcal Infections of the Bovine Udder. *Canad. Pub. Health J.*, 27:391, 1936.
7. Hansen, Arne. Mastitis. III. The Identity of *Streptococcus agalactiae*. *New York State Agri. Exper. Sta. Bull.* 232, 1935.
8. Hastings, E. G., and Beach, B. A. The Production of Milk of Abnormal Composition by Animals Free from Udder Streptococci. *J. Agri. Res.*, 54, 199, 1937.
9. Hotis, R. P., and Miller, W. T. A Simple Method for Detecting Mastitis Streptococci. *U.S.D.A. Circular* 400, 1936.
10. Hucker, G. J., and Udall, D. H. Relation Between the Presence of Fibrotic Tissue in the Udder and Streptococci or Cells in Freshly Drawn Milk. *Cornell Vet.*, 32, 23, 1933.
11. Little, R. B., and Foley, E. J. Staphylococci Associated with Mastitis. *J. Am. Vet. M. A.*, 87, 637, 1935.
12. Minett, F. C. Staphylococcus Antitoxin in the Blood and Milk of Cows and Other Animals. *J. Comp. Path. & Therop.*, 1, 173, 1937.
13. Mohler, J. R. Report of the Chief of the Bureau of Animal Industry, U. S. Dept. of Agri., 1935.
14. Mohler, J. R. Report of the Chief of the Bureau of Animal Industry, U. S. Dept. of Agri., 1936.
15. Munch-Petersen, E. Bovine Mastitis. Abstracts of Literature, Vols. I and II, Sidney, Australia, 1934.
16. Plastringe, W. N., Anderson, O. E., Brigham, G. D., and Spaulding, E. H. Infectious Bovine Mastitis. 2. The Streptococci of Chronic Bovine Mastitis. *Storrs Agri. Exper. Sta. Bull.* 195, 1934.
17. Plastringe, W. N., Anderson, O. E., White, G. C., and Rettger, L. F. Infectious Bovine Mastitis. 3. Methods of Control. *Storrs Agri. Exper. Sta. Bull.* 197, 1934.
18. Plastringe, W. N., Weirether, F. J., and Williams, L. F. Characteristics of Staphylococci Associated with Bovine Mastitis. *J. Bact.*, 31, 88, 1936.
19. Rosell, J. M. The Bacteriology of Chronic Streptococcal Mastitis. *Cornell Vet.*, 21, 317, 1931.
20. Udall, D. H., and Johnson, S. J. The Diagnosis and Control of Mastitis. *Cornell Univ. Agri. Exper. Sta.* 579, 1933.
21. Weatherall, C., and Dible, J. H. Aesculin Fermentation and Hemolysis by Enterococci. *J. Path. & Bact.*, 32, 413, 1929.

An Inexpensive Method for the Dehydration and Preservation of Complement and Other Biological Materials

ENRIQUE E. ECKER, PH.D., AND L. PILLEMER, PH.D.

*Institute of Pathology, Western Reserve University, and
University Hospitals, Cleveland, Ohio*

AS early as 1896, C. J. Martin¹ suggested the possibility and procedure involved in the preservation of guinea pig complement in the dried state. Noguchi,² in 1907, dried complement and amboceptor on filter paper. Shackell,³ in 1909, dried complement in the frozen state and showed that it could be preserved for months. Karsner and Collins,⁴ in 1919, applied Shackell's method for the preservation of various sera and in 1923 Hartley⁵ and his associates reported the dehydration of complement by distilling off the H₂O in vacuo. In 1931, Craigie⁶ dried complement from the frozen state by means of a vacuum desiccator, and more recently Elser⁷ and coworkers showed conclusively that biologicals could be dehydrated from the frozen state. This method was admirably developed by Flosdorff and Mudd⁸ and resulted in their dry-ice "Lyophile Apparatus" by means of which complement may be preserved for several months without any detectable deterioration.

The necessity of an inexpensive and simple method involving only apparatus available in the average laboratory led us to the construction of the following device:

The apparatus consists of a High-vac pump, a gallon size aspirator bottle or suction flask, which serves as a trap, and an ordinary vacuum desiccator. Since the success of the desiccating process depends upon a desiccant of great efficiency, porous (granular) barium oxide was selected.⁹ It takes up moisture with great rapidity and has no measurable vapor pressure and the fact that it cannot be reactivated is offset by its cheapness and availability. Barium oxide does not become sticky and does not channel if the container is properly filled.

THE PROCEDURE

The apparatus is set up in such a manner that the top of the aspirator bottle is connected to the top of the vacuum desiccator by means of a large glass T tube, 1.2-1.5 cm. in diameter, which is connected to a stopcock and manometer. The lower outlet of the aspirator bottle is attached directly to the pump with a heavy walled rubber connection. The bottom of the desiccator is filled with BaO and an equal amount is placed into the trap bottle. Thirty grams of BaO is sufficient to dry 1 c.c. of fresh serum. It is of im-

portance to increase the surface of the BaO by stratification. Cotton layers may be used. The lower outlet of the trap is filled with cotton to protect the pump. After greasing of all connections with stopcock grease, the sera are frozen in a dry ice bath with alcohol, acetone or kerosene. The vials are dried and placed in the desiccator; the pump is immediately started at full capacity to remove all residual air. By the time the frozen serum has reached the fusion temperature, the air pressure is reduced to such an extent that moisture is taken up by the BaO with sufficient rapidity to maintain the serum in the frozen state. Depending on the quantity of materials used, condition of the desiccant, the period of drying varied from 12 to 18 hours. An important point to note is that in the freezing of complement the thickness of the layer should not exceed 12 mm. Slanting and rotating the vials during freezing is a convenient method to increase the evaporating surface. After the first hour the speed of the pump may be reduced.

When drying is completed, the

vacuum is released slowly by way of the stopcock and the vials which contain the dried serum, which is highly hygroscopic, are immediately stoppered with rubber stoppers. For the insertion of the stoppers a small amount of oil (paraffin) may be used. Water should be strictly avoided. The air in the vials is then exhausted through a hypodermic needle attached directly to the High-vac pump. Five minutes suffice to secure vacuum sealing of the vials. Finally, the rubber stoppers are dipped in molten paraffin.

The method has proved to be effective in the drying of virus containing materials and other substances like human milk.

REFERENCES

1. Martin, C. J. *J. Path. & Bact.*, 3:507, 1896.
2. Noguchi, H. *J. Exper. Med.*, 9:455, 1907.
3. Shackell, L. F. *Am. J. Phys.*, 24:325, 1909.
4. Karsner, H. T., and Collins, K. R. *J. Infect. Dis.*, 25:427, 1919.
5. Hartley, P., Eagleton, A. J., and Okell, C. C. *J. Path. & Bact.*, 26:53, 1923.
6. Craigie, J. *Brit. J. Exper. Path.*, 12:75, 1931.
7. Elser, W. T., Thomas, R. A., and Steffen, G. T. *J. Immunol.*, 28:433, 1935.
8. Flösdorff, E. W., and Mudd, Stuart. *Ibid.*, 29:389, 1935.
9. Booth, H. S., and McIntire, L. H. *Indust. & Eng. Chem.*, 2:12, 1931.

Tennessee Opens Health Unit Building

A NEW building for the Gibson County health unit, at Trenton, Tenn., was dedicated recently. This building, erected and equipped at a cost of \$40,000, was built with the aid of the Commonwealth Fund.

The speakers at the dedication cere-

monies included Barry C. Smith, Executive Chairman of the Commonwealth Fund, and Wilson C. Williams, M.D., Tennessee State Health Officer.

Earl P. Bowerman, M.D., is at present Acting Director of this unit, succeeding Frank L. Roberts, M.D.

Educational Qualifications of Sub-Professional Field Personnel in Sanitation*

IN small health units where each of the persons engaged in environmental sanitation must of necessity cover a wide range, the individuals employed should in all cases meet the qualifications set forth for public health engineers or sanitarians. In the larger city and county health agencies having divisions of general, food, milk, and industrial sanitation, the direction of these various branches should likewise be by individuals meeting the qualifications set forth for public health engineers or sanitarians. It is realized that it may be necessary or desirable to employ or to continue to employ non-professional personnel in subordinate positions in the larger city and county health agencies until such time as public health adminis-

trators are able to require the higher standards prescribed for the public health engineer and sanitarian grades. The committee recommends:

1. That such sub-professional personnel be given the title of Sanitarian Assistant rather than the title of Sanitary Inspector, Sanitary Officer, or Sanitation Officer.

2. That the education and experience requirements be not less than graduation from high school, and at least 2 years' experience in some line of work that has brought the individual in contact with the general public.

3. That all sub-professional personnel be given in-service training, supplemented by such short course training as may promote proficiency in performing the duties assigned. The aim of these courses should be the equivalent of a 2 year college course.

Graduation from high school or its equivalent and completion of a 2 year course in an institution providing a course of instruction in public health prior to employment is considered the equivalent of 2 and 3.

4. That persons of this sub-professional group not having had instruction or experience in health work should not have passed their 35th birthday at the time of first employment.

W. S. LEATHERS, *Chairman*

* The Committee on Professional Education of the American Public Health Association publishes this progress report to permit the members and Fellows of the American Public Health Association to review it and to offer criticisms and suggestions to the committee in the further consideration of the report.

Approved by the Committee on Professional Education, April 29, 1938.

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

October, 1938

Number 10

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

THE SIXTY-SEVENTH ANNUAL MEETING

IT is not news to the members of the Association that every year for 66 years a convention has been held which from the earliest days to the present has engaged the attention, thought, and active participation of the best minds in the public health movement. Each year has seen the high-water mark advanced a little. Each year has recorded progress—in research, in technic, in application of scientific principles, in professional solidarity. There have been few Annual Meetings when something has not “broken,” as the gentlemen of the press say. Some of those “breaks” have represented the opening of a door and a sudden heretofore unsuspected vista down which many of us have trooped with enthusiasm and profit. Some still remain the first and last word definitely spoken and accepted.

The keynote of the more recent meetings has seemed to some observers to be that of reviewing, evaluating, checking, appraising, and assimilating. The currently popular phrase “refresher course” might be applied with truth. This is all to the good. One takes a deep breath after a long climb, looks around and back to survey what has been traversed. One also pauses on the levels to take stock of his companions and wait for the less fleet to catch up. The consciousness of ourselves as members of a body or a group comes to us in these lulls and we move on at last, never again so unaware of those beside us, above us, and below. Perhaps the reviewing process commented upon, has been responsible for the burgeoning recognition of ourselves as members of a powerful profession.

We approach the 67th Annual Meeting in Kansas City, Mo., October 25-28, in the strongest position as a profession that we have yet occupied. It is well then, with all that lies in the immediate future for public health workers in the way of the new and the untried, that we have had the opportunity to look back over the route we have come and to extract from our experiences and our awareness of each other fresh courage to attack the new heights. That there are new heights just ahead cannot be questioned. This meeting, coming as it does in a year of most significant happenings which have already put more money into public health budgets than ever before in our country's history and which

may soon release more funds than the most sanguine dreamed of even two years ago, may well mark the "ridge of the hill," to borrow Dr. Parran's vivid expression.

From the Association's standpoint this has been a remarkable year. As a natural result of expanding health services, the membership rolls have extended to an unprecedented length. There are 6,100 names on the roster, more than 1,000 added since the last Annual Meeting. We shall find many new faces at the 67th Annual Meeting. The new minds will help formulate the new philosophies whose beginnings may be traced back in later years to Kansas City in 1938.

FOOD POISONING BY STAPHYLOCOCCI

WITH increasing frequency reports are appearing concerning food poisoning by certain strains of the staphylococcus. Recently two unusually extensive outbreaks have occurred, one in the United States¹ and one in Canada.²

In May, 1936, there was reported to the State Board of Health of Montana an extensive food poisoning in Billings during which at least 54 persons were seriously affected. Investigations pointed very strongly to a single bakery and to cakes which contained a filling made of flour, eggs, water, and sugar. This was prepared in the bakery twice a week and stored in a mechanical refrigerator. The symptoms in almost all cases developed within 4 or 5 hours after eating the food. There was marked abdominal pain, frequent movements of the bowel—in some cases as many as 20—and vomiting, with severe prostration, but fortunately no deaths. The picture was that of an acute intoxication rather than bacterial infection. Fortunately, the original lot of filling for the orange cream cake which seemed to be the offending article could be obtained and was studied at the State Laboratory. Both the *Staphylococcus aureus* and *albus* were recovered and it seemed evident that both strains were associated with the production of the symptoms.

The second outbreak occurred in Hamilton, Ont., March, 1938, with 21 persons reported as having been poisoned. Investigation showed that custard filled pastry was the only article of food eaten in common which could be considered a possible source of illness. Members of the family who had not eaten the pastry were unaffected. In this outbreak the symptoms usually appeared in from 1½ to 2 hours. They were essentially the same as those described in the Montana outbreak. No deaths occurred. *Staphylococcus aureus* was isolated from the incriminated food as well as raw material used in its preparation and from the utensils used. A number of cultures were sent to the Connaught Laboratories where they were studied with great care. The investigation showed that three strains were practically identical in toxin production and that the cultures isolated from the pastry bag in the bakery were identical with those found in the incriminated food. Cultures of staphylococci from the noses and throats of the employees were easily divided into two distinct groups; one of which had properties very similar to those isolated from the suspected food, while the other produced toxin of much less potency. It seemed reasonable to conclude that the source of the infection was one person who had spread his infection to his fellow employees by whom it was further conveyed to raw materials, utensils and the finished food products. The bakery itself was in a sanitary condition and reasonable care in handling the finished products was

exercised. A point worth observing is that the absence of clinical evidence of a nose or throat infection in an employee was no indication that he was not harboring the microorganism.

In the Montana outbreak one history is perhaps particularly interesting. A woman purchased a layer cake on Saturday and ate of it Sunday evening. She was quite ill for several hours with vomiting and purging. Not suspecting the cake, she put a piece in her husband's lunch box which he ate at his midnight lunch. About 4 hours later he vomited 5 or 6 times, felt chilly, had 6 or 8 movements, and was markedly prostrated. Still not suspecting the cake, the following day this woman again put a piece in her husband's lunch box. This was eaten at the second midnight lunch and 3 hours later he had a recurrence of his illness.

Both of these investigations, one of which was very thorough, have demonstrated that fillings such as that described are one of the chief methods of spreading staphylococcus poisoning. Jordan long ago pointed out that staphylococcus was particularly apt to produce poison when grown on starchy medium.

Investigations^{3, 4} on staphylococcic mastitis in cows are important in this connection, since they indicate that this type of mastitis is probably more common than has been believed. Strong evidence of the danger of such infections has been brought forward. Shaughnessy and Grubb, in every outbreak investigated by them, have found cases of staphylococcic mastitis in the herd which supplied the milk. They suggest that the parasitic staphylococci may be more capable of producing an enterotoxin than the saprophytic forms. Here is another argument for the pasteurization of all market milk, though, as in the Hamilton outbreak, it would not have been effective, as the contamination of the food products evidently took place from handlers of the food product.

REFERENCES

1. Roberts, James, Deadman, W. J., and Elliot, G. J. An Outbreak of Staphylococcal Food Poisoning. *Canad. Pub. Health J.*, July, 1938, p. 325.
2. Cogswell, William F., Kilbourne, Burton K., and Kuhns, Edith. Staphylococcal Food Poisoning in Billings, Montana. *Canad. Pub. Health J.*, July, 1938, p. 33.
3. Shaughnessy, H. J., and Grubb, T. C. Staphylococcus Food Poisoning, Report of a Small Milk-borne Epidemic. *J. Infect. Dis.*, 58:318, 1936.
4. Shaughnessy, H. J., and Grubb, T. C. The Incrimination of Milk and Milk Products in Staphylococcus Poisonings. *Canad. Pub. Health J.*, May, 1937, p. 229.

NOTE: Experiments with Staphylococcal Enterotoxin, by C. E. Dolman and R. J. Wilson, published in *Journal of Immunology*, July, 1938, p. 13, will be found very interesting by all students of this subject.

DIPHTHERIA IMMUNIZATION

IMMUNIZATION against diphtheria has occupied the attention of scientific men for a number of years. Many of our states have been very active in carrying it out and successful campaigns have borne rich fruit. Great advance was made when Ramon invented his toxoid, the so-called anatoxine. Soon, however, it was shown that toxoid precipitated with alum gave a preparation which was very efficient and that a high degree of immunity could be obtained with a single injection, a tremendous advantage in carrying out immunization on a large scale. In this country perhaps alum precipitated toxoid is still more largely used than any other preparation and is producing good results.

France has lately (June 25, 1938) put the official stamp of approval on immunization against diphtheria, making it compulsory for all children during infancy, that is, in the second or third year of life. The actual law is as follows¹:

"Antidiphtheria vaccination with l'anatoxine (toxoid) is compulsory during the second or third year of life. The parents or guardians are personally responsible for the carrying out of this measure, proof of which shall be furnished on admission to any school, nursery, vacation colony, or other assembly of children.

During the first year of application of the present article, all children under 14 years of age attending the schools, if they have not yet been vaccinated against diphtheria, shall be subjected to such vaccination.

A public administrative regulation, rendered according to the opinion of the Academy of Medicine and the Consultative Committee on Public Health of France, shall decide the measures necessitated by the application of the preceding provisions."

REFERENCE

1. *Pub. Health Rep.*, July 29, 1938, pp. 1301-1302.

BOOKS AND REPORTS

Life, Heat, and Altitude: Physiological Effects of Hot Climates and Great Heights—By *David Bruce Dill*. Cambridge, Mass.: *Harvard University Press*, 1938. 211 pp., 27 tables, 25 figs. Price, \$2.50.

In the style of swing music, this book presents a succession of variations on the basic theme that every animal physiologic function depends upon the supply of oxygen. Temperature regulation and the rôle of sweat therein; thirst of fish, frog, man, and dog; the breath and the blood of Clarence DeMar or of the Peruvian llama; the reason for prostrations in the early heat waves of our summer; the psychological condition of the crew of a China Clipper in flight to Hong Kong and back, all are shown to possess a common denominator in their relation to oxygen transport by erythrocyte, serum, and lymph, where electrolytes, ions, and water are shifted according to rule and to suit the occasion. Here is no trite recitation of orthodox dogma, but rather a vigorous presentation of personal convictions with supporting evidence, based to a refreshing degree upon the original work of a group of collaborators of the Fatigue Laboratory at Harvard who performed tests upon each other while themselves under stress of desert heat or the anoxemia of altitude, who found time and interest to study the animals they could collect about them in strange places.

Arranged for a series of Lowell Lectures, the material is presumed to be addressed to the non-technically trained, and to any thoughtful reader will be informative. Its appeal to the biologist who is accustomed to the

language and the symbols of experimental physiology is assured. The feeling of the reviewer upon reading the volume from cover to cover is that here is physiological literature fresh, reliable, attractive, compounded of virtuosity and convincingness.

Besides technical interest for aviators, travellers, mountain climbers, physicians, physiologists, and biochemists, there is here much of fundamental importance for the student of personal or public hygiene.

JOHN W. M. BUNKER

The Public Assistance Worker—*Edited by Russell H. Kurtz*. New York: *Russell Sage Foundation*, 1938. 224 pp. Price, \$1.00.

This compact volume is as comprehensive a survey of the public assistance field as has yet been written.

In the first chapter Arthur Dunham outlines the development of relief agencies in America and the problems that they face. Donald S. Howard next explains what requirements an applicant for relief must meet and what are the long-time results of his having to do so. Margaret E. Rich continues the discussion of how people are affected by receiving relief, indicating what reaction they may have to the procedures involved in applying for the various types of assistance. Dora Goldstine takes up the problem of maintaining the health of people receiving assistance, pointing out that the adequacy of the aid given has a great deal to do with the physical condition of the recipients and that the social worker can do much to lift the general level of physical well-being among those she comes in contact with if she

knows the danger signals of ill health and the resources there are to call upon.

In conclusion, Gertrude Vaile discusses the relationship of the public assistance worker to her community and Russell H. Kurtz has a chapter on her relationship to the profession of social work.

CATHERINE GROVES PEELE

Practical Physiological Chemistry
—By Philip B. Hawk and Olaf Bergeim (11th ed.). Philadelphia: Blakiston, 1937. 968 pp. Price, \$8.00.

To those unacquainted with this standard work, it may be described as a comprehensive system of biochemical methods interwoven with an interpretive text of principles and facts. It is a veritable storehouse of procedures which maximizes the practical side; yet, through the enviable economy of words its factual content covers the entire field, and in fundamentals achieves exceeding completeness. That was its original design: even now in the eleventh edition it remains unchanged. Since its first appearance this book, while expanding, has been able to accommodate within its original framework the onrush of new topics from the almost cataclysmic developments in the biochemical world. That it has passed through 10 editions in 30 years, retaining its best features to be combined with new material, attests the soundness of this plan.

Truly the task of surveying the ever widening biochemical domain has become herculean; hence, the participation of two collaborators in the preparation of this edition is not unexpected. In it, 12 chapters have been rewritten. Enlisted for certain of them were the services of specialists who have treated their topics with a sureness of one who has been over the ground. The latest techniques are explained in detail and every selection draws upon the experi-

ence of these qualified investigators. It is through its accuracy and reliability that a method earns its claim to consideration. On these points even critical judgment and discriminatory powers cannot substitute for a working knowledge of a particular method.

In all essentials the book maintains its previous high standards. Its detailed methodology, its concise informative text, and its well selected bibliography still assure it what it has held for so long, an important place in bench-side biochemistry.

H. D. KRUSE

The Chemical Analyses of Foods and Food Products—By M. B. Jacobs. New York: Van Nostrand, 1938. 487 pp. Price, \$6.00.

The book is a systematic presentation of methods of chemical analyses of foods and food products. The details of methods are supplemented by 65 useful tables and 56 figures.

Following introductory chapters on general methods of analysis are chapters dealing with coloring matters, preservatives and metals in foods and then more detailed methods as applied to milk products, oils and fats, sugars and carbohydrates, and gums, cereals, starch and other polysaccharides. Further chapters deal with jams, jellies, and fruits; spices, flavors and condiments; non-alcoholic beverages; alcoholic beverages; meat, fish, and eggs, and vitamins.

The author has presented short practical methods which are of importance in routine analyses of foods. The methods are up-to-date and well presented and much of the information deals with newer methods difficult for the average worker to obtain otherwise.

The book should be a valuable addition to the library of any food chemist or technologist or any other worker dealing with foods. It should also be helpful as a reference volume or text-

book in teaching or in routine analytical and control laboratories.

CARL S. PEDERSON

Handbook on Social Hygiene—
By W. Bayard Long, M.D., and Jacob A. Goldberg, Ph.D. Philadelphia: Lea & Febiger, 1938. 442 pp. Price, \$4.00.

Here is a timely and authoritative symposium. It furnishes 442 pages of technical guidance and basic philosophy in social hygiene—that field where problems relating to sex are given an airing. It should prove particularly helpful to sanitarians, especially to those among the state, city, and county health officers who have heard and participated in sporadic discussions on "lues" and "Neisserian infections" for many years, but who have accomplished little in the control of syphilis and gonorrhea.

The past 2 years have witnessed the renaissance of efforts designed to control and eventually eliminate the venereal diseases. With the recent passage of the LaFollette-Bulwinkle Bill, the U. S. Public Health Service is in a better position to implement the nation-wide campaign, but, as the editors say, "Limitations of our present medical and institutional facilities; drawbacks of the available drugs, and shortcomings of current chemotherapy; lapses in diagnostic tests and the need for their improvement—these and many other problems are still to be faced from the point of view of diagnosis and treatment."

Far more space than is allotted for this review would be required to evaluate the volume adequately. Therefore the reviewer takes refuge in listing the section headings and authors and letting them tell their own stories:

"The Campaign Against Syphilis and Gonorrhea," by William F. Snow, M.D.; "History and Cutaneous Manifestations of Syphilis," by Howard Fox, M.D., Sc.D.;

"The Diagnosis of Syphilis," by W. Bayard Long, M.D.; "The Treatment of Syphilis," by Dr. Long; "Syphilis of the Nervous System," by I. S. Wechsler, M.D.; "The Medical Aspects of Syphilis," by I. Ogden Woodruff, M.D.; "Syphilis and Gonorrhea of the Eye," by Conrad Berens, M.D.; "Prenatal and Congenital Syphilis," by W. Bayard Long, M.D.; "Gonorrhea in the Male," by Howard S. Jeck, M.D.; "Gonorrhea in the Female," by Emily Dunning Barringer, M.D.; "Vaginitis," by Reuel A. Benson, M.D.; "Laboratory Aspects of the Venereal Diseases," by John F. Mahoney, M.D.; "Hospitals and Out-Patient Clinics—Their Organizations and Management in Relation to the Venereal Diseases," by Claude W. Munger, M.D.; "Department of Health Programs for Combating Syphilis and Gonorrhea," by Charles W. Clarke, M.D.; "Statistics Relating to Syphilis and Gonorrhea," by Jacob A. Goldberg, Ph.D.; "Social Service and Epidemiology Relating to Venereal Diseases," by Rosamond W. Goldberg, R.N., Ph.D.; "The Responsibility of Nursing Schools in the Control of Syphilis and Gonorrhea," by Anna D. Wolff, R.N.

"The Public Health Nurses and Syphilis Control," by Amelia H. Grant, R.N.; "The Problems of Syphilis and Gonorrhea in Family Welfare Agencies," by Alta E. Dines, R.N.; "Social Hygiene Education in Relation to Venereal Disease Control," by Maurice A. Bigelow, Ph.D., Sc.D.; and "Legal Aspects of the Venereal Diseases," by Jacob A. Goldberg, Ph.D.

RAY H. EVERETT

Syphilis, Gonorrhea, and the Public Health—By Nels A. Nelson and Gladys L. Crain. New York: Macmillan, 1938. 360 pp. Price, \$3.00.

The authors of this book are to be congratulated upon the success with which they have solved the many problems which must have arisen in presenting the salient facts concerning the natural history and control of these two diseases to the diverse groups which are, or should be, interested. The book is written for "health officers, physicians, nurses, social workers, and public health workers in general, as well as that part of the general public which is interested in the control program."

The three main divisions will appeal to different groups of readers, but each is comprehensive and authoritative enough to justify getting the book for its sake alone. The first main division (Part II) outlines for syphilis and gonorrhea separately the basic facts about the causative agents, course of infection, diagnosis, treatment—including unfavorable reactions to treatment—and modes of infection. It is unfortunate that a more definite position could not have been taken on the treatment of gonococcal infections with sulfanilamide at the time this section was written, but the authors have at least taken a conservative stand in awaiting the verdict of more extensive trial. The discussion of the clinical aspects uses technical terms, but these are explained in sufficient detail so that laymen should have little difficulty. Medical readers also will find these chapters highly informative.

The second main division (Part III) consists of a review of the somewhat fragmentary knowledge of the general epidemiology of gonorrhea and syphilis, each item being presented with due regard for its limitations.

The third main division (Parts IV and V) is the most significant for the public health worker, for it discusses control programs and the problems encountered in their formulation and application. Few Gordian knots are cut but the authors do not fail to offer practical approaches to the solution of questions confronting both state and local health workers, including methods of reporting, case finding and case control, the provision of laboratory, therapeutic, and consultation services, education of the various groups chiefly concerned, the relative duties of nurses and of social workers, financing, and the relationship of social hygiene to the control program.

It does not detract from the value of this book to say that the discussion

is largely from the point of view of the control program as developed by the Massachusetts Department of Public Health, for that state has an advanced program—thanks in no small degree to the senior author. In its broad outlines the Massachusetts program accepts the measures recommended by the U. S. Public Health Service for state and local health departments in January, 1936.¹ However, there are a number of respects in which it is definitely at variance with current practice elsewhere and with the recommendations expressed or implied. Among these are the inclusion of gonorrhea with syphilis on an active basis in the control program, and the fact that legislation "against" the disease is kept at a minimum. The authors cite conflicting viewpoints and give their opinions, which are cogently expressed.

The volume draws from the experience of a decade of earnest and thoughtful work in the field of the genitoinfectious diseases and should be widely read.

1. Vonderlehr, R. A., et al. Recommendations for a Venereal Disease Control Program in State and Local Health Departments. *V. D. Inf.*, 17, 1:1 16 (Jan.), 1936.

RALPH E. WHEELER

Nutrition of the Infant and Child
—By Julian D. Boyd, M.D. New York: National Medical Book Co., 1937. 198 pp. Price, \$3.00.

This monograph should prove helpful to the medical student and general practitioners of medicine. The pediatric specialist will find very little new material in it. The book apparently was not conceived for the lay reader. After the fundamental considerations of food requirements are stated, considerable attention is given to departures from normal nutrition. The chapters on breast and artificial feeding are very practical. The illustrations deal largely with pathologic conditions due to malnutrition, undernutrition, and avita-

minoses. Practical methods of handling the infant for various therapeutic measures are well described and illustrated. Helpful tables and diet schedules for the normal and the sick infant are given at the end.

RICHARD A. BOLT

Child Guidance Procedures: Methods and Techniques Employed at the Institute for Juvenile Research — *The Century Psychology Series*. By the Staff of the Institute for Juvenile Research, Chicago, Paul L. Schroeder, M.D., Director. New York: Appleton-Century, 1937. 362 pp. Price, \$2.50.

The Institute for Juvenile Research, in a quite definite sense, may be looked upon as the parent organization in the field of child guidance clinics. From it also have come some notable studies particularly in the fields of sociology, psychology, and psychiatry which amply justify the authors in looking upon the institute as a research center. It has served as a training center, though its chief purpose has been service to those brought to its attention.

This well written and well edited book aims to make explicit the procedures in child guidance as practised in the institute. There are chapters devoted to the Social History, The Medical Study, the Psychological Examination, The Psychiatric Interview—the so-called fourfold approach to the problem—and also a chapter entitled The Recreation Study. In the majority of clinics the latter is not assigned to special workers, and we see no particular reason for separating it as a special procedure. A good deal of the material investigated would quite naturally fall to the lot of social worker and, in particular, psychiatrist. In fact, one could well raise the question—and the authors hint at it—Whether this division into 4 or more parts at the hands of as many individuals of dif-

ferent and diverse training is either so valuable or so necessary. There has been a growing tendency in many clinics to ignore the so-called fourfold approach and to center the study and treatment in one or another of the staff, depending on the nature of the problem presented. Clinics may vary markedly in their intake policy, which in turn would affect the nature of the study. Those clinics which can control their intake policy and in which psychiatry is emphasized—not sociology—will deal with neurotic children to a much greater degree than with social delinquents, and the approach will of necessity be different.

There is an interesting chapter entitled, Synthesis and Program of Therapy, in which appears an Outline of Psychotherapy and Other Aids in Adjustment. In it are outlined various procedures and technics that may be employed by the psychiatrist in treatment.

The illustrative cases, as is usual, do not clearly illustrate, though they do show what can be done, often under adverse conditions.

The chapter, The Clinic and the Community, Table I, shows what we feel to be a desirable trend, namely the acceptance in recent years of many more cases referred by parents and schools and less from the social agencies. This points to the institute's increasing interest in the neurotic child and a more definitely psychiatric approach to the problems.

The book quite adequately presents what the title indicates—child guidance procedures. It undoubtedly will serve to give the reader not trained in a child guidance clinic an idea of the procedures, methods, and ideology of the average clinic. We recommend it to health officers, administrators and, in particular, those dealing with child Welfare.

HENRY C. SCHUMACHER

Graphs: How To Make and Use Them—By *Herbert Arkin and Raymond R. Colton*. New York: Harper, 1936. 224 pp. Price, \$3.00.

This book should be on bookshelves next to "Statistical Methods" by the same authors. It is the first book on graphs in which we have seen all of the "tricks of the trade" listed.

The first three chapters are devoted to principles, construction, and equipment, in which are set forth the various kinds of paper, pens, inks, and lettering guides. Separate chapters are devoted to the different types of charts where in each case may be found a list of common errors to avoid. The authors cite rules for titles and footnotes which if followed would take the curse off many charts. They also stress the point that charts should be simple and should tell one story, not many. Chapters are also given to reproduction of graphs and the preparation of statistical tables and reports. There is also a complete index.

The entire book is written in the simple straightforward style that made *Statistical Methods* so valuable.

While it does not confine itself to the presentation of public health statistics all of the material is applicable to this field and it will be of great assistance to anyone interested in or concerned with modern graphic presentation of public health statistics for both the lay public and the professional groups.

E. J. Cross

How To Live—By *Irving Fisher, LL.D., and Haven Emerson, M.D.* (20th ed.) New York and London: Funk and Wagnalls, 1938. 422 pp. Price, \$2.50.

A book which has reached its 20th edition and the worth of which has been recognized in every part of the United States, does not call for a review—only an announcement of a new edition. However, this last volume

sees Dr. Haven Emerson as co-author with Professor Irving Fisher in place of the late Dr. Eugene Lyman Fisk, who was associated with Professor Fisher in getting out the earlier editions, and to whose memory the book is now dedicated.

This edition has followed the earlier ones in bringing the subject matter up to date and in presenting the most recent authoritative conclusions on each subject discussed. The authors regard the book as unique and even radical in its recommendations, but properly hold that it is based on the work of conservative advisers and hope that they are just a little ahead of the world, which will eventually catch up with them.

A striking feature is the 32 appendices, each by a specialist in his field. These appendices constitute approximately two-thirds of the volume. A good index adds to the value. It should be noted that the royalties from the sale of this book will be donated to meet the expense of the Vitality Records Office through which valuable information is being collected as to the influence of habits on health.

It can be recommended without reserve. It will unquestionably maintain the high place in the regard of the public earned in the past.

MAZÛCK P. RAVENEL

The Radiology of Pulmonary Tuberculosis—By *J. E. Bannen, M.B., Ch.B., D.M.R.E.* Baltimore, Md.: Wood, 1937. 156 pp. Price, \$4.50.

This is an excellent synopsis of the subject. To those in public health work who desire to refresh themselves concerning the pathology of the lungs as revealed by X-ray, it should be of inestimable help.

There is a good chapter on the physical examination of the chest and the clinical aspects of pulmonary tuberculosis. The illustrations are adequate

and a good bibliography is provided.

It is recommended to those who use X-ray in case finding.

HARRY E. UNGERLEIDER

Bulletin of the Health Organisation of the League of Nations—*Geneva*. Vol. VI, No. 4, August, 1937, 177 pp.

This bulletin is devoted to two subjects and contains a large amount of valuable information. Both subjects are important and timely. The first deals with the Hygiene of Housing; and the second, with Physique and Health. An extensive bibliography is given at the end of each presentation.

The discussion of the Hygiene of Housing is divided into three parts. The first deals with the report of the Housing Commission of the League and tells briefly of the work done by the various Committees on the Hygiene of Housing in the United States, France, the Netherlands, Poland, the United Kingdom, Sweden, and Czechoslovakia.

The second part deals with the report of the Housing Commission of the League and its associated experts, on the Hygiene of Environmental Conditions in the Dwelling. Among the items discussed are: factors influencing bodily heat exchanges and comfort; sensation of warmth; optimum environmental conditions; methods of measuring environmental conditions; transmission and accumulation of heat by building materials; heating; cooling; ventilation; air conditioning; and program of studies: coöperation, and teaching.

The third part deals with the report on Noise and Housing which was made by the same Commission and a special group of experts.

The second subject treated in the *Bulletin* deals comprehensively with Physique and Health. The report represents the results of a series of in-

quiries into the physiology, anthropometry, pathology, physical activity, and education of human beings throughout the life span. In the words of the author, "after successfully tackling epidemiology and the environment of life, hygiene is turning its attention to man viewed as a whole." Each phase of life, from the prenatal stage and infancy to old age, comes in for special consideration. The basic data have been obtained from studies made in Austria, Great Britain, Czechoslovakia, Denmark, France, Germany, and Poland. Data from investigations conducted in the United States are also cited. To those who are interested in the growth of children, their physical defects, and their hygienic treatment, including provision for physical exercise and play, the report should prove of great interest and value.

MURRAY P. HORWOOD

The Diagnosis of Syphilis by the General Practitioner—By Joseph Earle Moore, M.D. *U. S. Public Health Service pamphlet (originally Supplement No. 5 to Venereal Disease Information)*. Washington: U. S. Gov. Print. Off., 1938. 36 pp. Price, \$.10.

Because case finding is basic in the stamping out of syphilis and because medical practitioners have the best opportunities for case finding, the means by which the practitioner can more readily suspect and more accurately diagnose suspected cases are given in this compact outline of diagnosis. Diagnostic maxims and lists of conditions with which syphilis should be considered in differential diagnosis are given in tabular form. The sole emphasis is not, however, upon diagnosis as a means of case finding. Contact follow-up is urged as a no less vital aspect of case finding and "the unavoidable responsibility of every physician who makes the diagnosis of early syphilis."

RALPH E. WHEELER

Sewerage and Sewage Treatment
—By *W. A. Hardenbergh*. Scranton,
Pa.: *International Text Book Co.*,
1936. 396 pp. Price, \$3.50.

This is an elementary textbook which covers the field in 24 chapters.

Hydraulics of sewers	24 pp.
Pipe sewers	28
Sewers built in place	11
Sewer appurtenances	20
Miscellaneous features of sewerage systems	13
Planning of sewerage systems	13
Design of sanitary sewers	32
Design of storm and combined sewers	30
Pumping of sewage	11
Construction of sewers	17
Records and estimates	14
Fundamentals of sewage treatment	17
Dilution and irrigation	5
Grit removal and screening	14
Sedimentation	30
Chemical treatment of sewage	15
Activated sludge treatment	11
Secondary treatment of sewage	29
Treatment and disposal of sludge	7
Disinfection	6
Industrial wastes	3
Institutional waste treatment	17
Operation of sewage treatment plants	4

The preface states that the book is intended to present a balanced and basic treatment of the subject for the student and also a text for the engineer who is confronted only occasionally with problems in this field. As a first reader in the sewerage and sewage treatment field, the book is well written and of use to those who are not familiar with the more detailed textbooks. Its value would certainly seem to be impaired by the omission of references, except to ASTM standards. The discussion of sewerage is excellent. In general, the material is up-to-date and illustrates recent practice. For health officers, non-technical sewage works operators, and laymen who want general information, the book should be of value.

A few errors were noted. In discussing the activated sludge process,

the author states that many kinds of air diffusers have been tried, but those made from ground quartz have generally been found most suitable. However, in the last 10 years carborundum and alundum have proved equally acceptable. The author also states that "the plates are usually set in cement mortar in order to prevent clogging around the edges." The real reason for the mortar is to hold the plates in place.

The design of final sedimentation tanks for activated sludge is summed up in 6 lines, saying the same general principles apply as in the case of sedimentation tanks in other processes. Practice has, however, shown a wide difference in design of settling tanks for handling raw or chemically coagulated sewage and activated sludge.

The treatment of the subject of sludge disposal is rather summarily handled. The disposal of air-dried sludge for fertilizer might have been mentioned, as at Baltimore, Rochester (N. Y.), and many other cities. In dewatering digested sludge on a vacuum filter the use of lime as a conditioning agent should have been included. Elutriation, though mentioned, should be noted as of value chiefly only on digested sludge.

In discussing chlorination, the author revives an outworn belief that bleaching powder has the advantage "that the chlorine contained in it is more effective for sewage chlorination than is liquid chlorine."

LANGDON PEARSE

Jurisprudence for Nurses: Legal Knowledge Bearing Upon Acts and Relationships Involved in the Practice of Nursing — By *Carl Scheffel, Ph.B., M.D., LL.B., and Eleanor McGarvah, R.N.* (2nd ed.). New York: *Lakeside Publishing Co.*, 1938. 248 pp. Price, \$3.00.

The second edition of this text, first

issued in 1931, has been broadened somewhat to include new material on the legal standards of the nursing profession. Like the first edition, it also presents useful information on legal obligations of nurses, contracts, wills, the nurse as witness, criminal re-

sponsibility, and property rights. It should be helpful to nurses in the prevention of personal litigation, which in this legalistic era seems to be an achievement almost as salutary as the prevention and alleviation of disease.

JAMES A. TOBEY

BOOKS RECEIVED

THE TECHNIQUE OF CONTRACEPTION—AN OUTLINE. By Eric M. Matsner, M.D., and Frederick C. Holden, M.D. 4th ed. New York: National Medical Council on Birth Control, 1938. 50 pp. \$5.00.

THE TROUBLED MIND—A STUDY OF NERVOUS AND MENTAL ILLNESSES. By C. S. Bluemel. Baltimore: Williams & Wilkins, 1938. 520 pp. Price, \$3.00.

WATER SUPPLY AND SEWERAGE. By Ernest W. Steel, C.E. New York: McGraw-Hill, 1938. 653 pp. Price, \$5.00.

PHYSICAL AND HEALTH EDUCATION—PRINCIPLES AND PROCEDURES. By Helen Norman Smith and Helen Leslie Coops, Ph.D. New York: American Book Co., 1938. 323 pp. Price, \$2.25.

OSLER'S PRINCIPLES AND PRACTICE OF MEDICINE. Originally by Sir William Osler, M.D. Revised by Henry A. Christian, M.D., LL.D. 13th ed. New York: Appleton-Century, 1938. 1424 pp. Price, \$9.00.

POISONING THE PUBLIC. By Russell C. Erb. Philadelphia: Dorrance & Co., 1937. 219 pp. Price, \$2.00.

ADVENTURES IN SELF-DISCOVERY. By David Seabury. New York: McGraw-Hill, 1938. 324 pp. Price, \$2.50.

PENNY MARSH. PUBLIC HEALTH NURSE. By Dorothy Deming. New York: Dodd, Mead, 1938. 266 pp. Price, \$2.00.

AN INTRODUCTION TO MEDICAL STATISTICS.

By Hilda M. Woods and William T. Russell. London: King & Son, 1936. 125 pp. Price, \$2.75.

THE NEW BABY. By Evelyn S. Bell and Elizabeth Faragoh. Philadelphia: Lippincott, 1938. Price, \$1.00.

SOCIAL WELFARE LAWS OF THE FORTY-EIGHT STATES. Compiled by Wendell Huston. Seattle: Wendell Huston Co., 1937. Loose Leaf Form. 1400 pp. Price, \$12.50.

THE LABORATORY. Vol. 9, No. 5. Published by the Fisher Scientific Co., Pittsburgh. 16 pp. Free.

YOUR BABY AND CHILD. By M. C. Overton. Lubbock, Tex.: Your Baby and Child Pub. Co., 1936. 224 pp. Price, \$2.00.

ADVENTURES IN LIVING SERIES. NEW WAYS FOR OLD. By Thomas D. Wood, Marion O. Lerrigo and Nina B. Lamkin. New York: Nelson, 1938. 320 pp. Price, \$.88.

A TEXTBOOK OF PATHOLOGY. For Use in Schools of Nursing. By Armin V. St. George. 2nd ed. New York: Macmillan, 1938. 238 pp. Price, \$1.75.

TEXTBOOK OF ANATOMY AND PHYSIOLOGY. By Diana Clifford Kimber, Carolyn E. Gray, and Caroline E. Stackpole. 10th ed. rev. New York: Macmillan, 1938. 643 pp. Price, \$3.00.

BABIES ARE HUMAN BEINGS. By C. Anderson Aldrich and Mary M. Aldrich. New York: Macmillan, 1938. 128 pp. Price, \$1.75.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

France Goes After Diphtheria— Translation of the French law requiring immunization of all children during infancy or the second or third year of life.

ANON. Diphtheria Immunization Made Compulsory in France. Pub. Health Rep. 53, 30:1301 (July 29), 1938.

Diphtheria Prevention—New England and Middle Atlantic cities report a continuing downward trend in diphtheria, as do the western cities. Elsewhere the record is not quite so good. There is evidence that the preventive program produces results.

ANON. Diphtheria Mortality in Large Cities of the United States in 1937. J.A.M.A. 111, 6:524 (Aug. 6), 1938.

Where Diets Are Deficient— Calcium lactate in half-grain daily doses accelerated growth and improved the condition of poorly nourished nursery children. Teachers thought it helped the mental performance of the children too. It is recommended as a partial milk substitute when fresh milk cannot be supplied.

AKROYD, W. R., and KRISHNAN, B. G. Effect of Calcium Lactate on Children in a Nursery School. Lancet. 2, 3:153 (July 16), 1938.

How They Die of Rabies— First-hand observations upon a dozen persons as they died of rabies: with pictures! These might be useful for health educators who have to meet antivivisectionists on their home grounds.

BLATT, M. L., *et al.* Rabies. J.A.M.A. 111, 8:688 (Aug. 20), 1938.

Catching Up with the Migrant— For the hundreds of thousands who migrate to California seeking jobs, the

state health service furnishes maternal and infant hygiene, tuberculosis case finding, public health nursing and education in nutrition. What the wanderers seem to need most is education in hygienic living. Administrators will want to know just what this state is doing, hence the report is most timely.

DICKIE, W. M. Health of the Migrant. J.A.M.A. 111, 9:763 (Aug. 27), 1938.

Hitler Jugend and T.B.—In Germany, where everyone presumably is under the control of the State, tuberculosis prevention should be a really productive enterprise, but it seems that it suffers from much the same faults as the program in this country where individualism—rugged or ragged—reserves to each the right to enjoy his infection unmolested.

EDWARDS, H. R. Tuberculosis Control in Germany. Am. Rev. Tuberc. 38, 1:115 (July), 1938.

Brucella Infections and the Lab.—Evidence is presented indicating that no single test can be relied upon to give unfailing proof of chronic brucellosis. High agglutination titres are of significance, a positive skin test is suggestive, and an opsonic reaction is found least reliable. Some brucella infections are negative to all three tests.

EVANS, A. C., *et al.* Studies on Chronic Brucellosis. Pub. Health Rep. 53, 34:1507 (Aug. 26), 1938.

Measles in a School Community—In an epidemic of measles in a boarding school, healthy susceptible children should be allowed to have a normal attack of the disease, while "delicate" susceptibles should be partially or completely protected with immune serum.

How the epidemic was treated in one British institution is told.

HOBSON, F. G. Measles. The Conduct of a School Epidemic. *Brit. M. J.* 4046:171 (July 23), 1938.

Protecting British Mothers—Four British papers on prevention of puerperal sepsis cover about the same ground that four similar American papers would traverse. As with us, the way is evident, but the performance totters. American pediatricians will read the series with sympathetic interest.

JOHNSTONE, R. W., *et al.* The Prevention and Control of Puerperal Sepsis. *Brit. M. J.* 4049:331 (Aug. 13), 1938.

It Runs in Families—Siblings of children susceptible to caries had more than twice the incidence of tooth defects that afflicted the brothers and sisters of persons with healthy teeth. The conclusion is justified that familial resemblances in carious conditions exist. No specific explanation is offered.

KLEIN, H., and PALMER, C. E. Studies on Dental Caries. *Pub. Health Rep.* 53, 31:1353 (Aug. 5), 1938.

Of Interest to Pneumonia Campaigners—Reporting the successful use of anti-pneumonia rabbit serum in 6 types of pneumococcus pneumonia. No patients died when treated within 90 hours, and no untoward reactions marred the picture.

LOUGHLIN, E. H., *et al.* The Treatment of Lobar Pneumonia with Rabbit Antipneumococcus Serum. *J.A.M.A.* 111, 6:497 (Aug. 6), 1938.

Public Hygiene and Decent Housing—Our duty is clear, concludes this Canadian sanitarian: use every opportunity to bring to public attention the urgent need for play space, and the desirability of one-family dwellings; get solidly behind every effort being made to provide adequate housing facilities.

Would that the duty were equally clear to all sanitarians in the United States!

MACDONALD, R. ST. J. Progress in Housing and Health. *Canad. Pub. Health J.* 29, 8:377 (Aug.), 1938.

Recent Social Hygiene Events—Herein is recounted what state health departments and local official and voluntary agencies are doing in the prevention of syphilis: an impressive total of activities.

PINNEY, J. B., and SHENEHON, E. N. Footnotes to Progress. *J. Social Hyg.* 24, 5-6:245 (May-June), 1938.

Noise—Even though Heaven is alleged to have a select choir and a good loud orchestra, what this earth needs is more quiet, says this British authority on ear-shattering noises by day and sleep-disturbing rackets by night. He discusses the reasons why.

PURVES-STEWART, J. The Influence of Noise on Health. *J. Roy. San. Inst.* 1, 11:667 (Aug.), 1938.

Serving the Worker in Small Industries—Because a very great number of workers are employed, collectively, in plants each too small to provide a health service, there is an effective opportunity here for governmental health administration. How far these needs are being met is told, and a promising program is suggested.

SAYERS, R. R., and BLOOMFIELD, J. J. Public Aspects of Industrial Health. *J.A.M.A.* 111, 8:679 (Aug. 20), 1938.

For Industrial Hygienists—Although there is no one sure method of preventing the pneumoconioses, the conditions causing them may usually be avoided if industrial engineers and physicians will cooperate in adopting measures of known effectiveness.

SAYERS, R. R., and JONES, R. R. Silicosis and Similar Dust Diseases. *Pub. Health Rep.* 53, 33:1453 (Aug. 19), 1938.

ASSOCIATION NEWS

THE TWENTIETH ANNUAL HEALTH EXHIBIT

ALMOST as important as the scientific program at Annual Meetings of the Association is the Health Exhibit which at Kansas City will be celebrating its twentieth anniversary.

The great Exposition Hall of the Municipal Auditorium in Kansas City is the scene of the Twentieth Annual Health Exhibit. Here, on the same floor with Registration and Information Headquarters, Health Education and Publicity Headquarters, the Motion Picture Theatre, the Association and Local Committee offices, more than one hundred commercial and scientific exhibitors will hold forth. The commercial exhibitors have been carefully selected and screened and only those organizations with products of real worth are permitted to engage the attention of the 3,500 delegates. The Health Exhibit, therefore, is a setting for pedigreed products and, as such, they are commended to public health workers for purchase for their departments and institutions and for recommendation to the public.

The exhibitors whose applications for space have been accepted are:

Abbott Laboratories
American Can Company
American Cyanamid & Chemical Corp.
Birds Eye Laboratories
The Borden Company
Carnation Company
The Coca Cola Company
Dermetics Company
Difco Laboratories, Inc.
The Diversey Corporation
Eisele & Company
J. B. Ford Sales Company
Gerber Products Company

Geuder, Paeschke & Frey Company
Gilliland Laboratories
A. J. Griner Company
Hobart Mfg. Company
Horlick's Malted Milk Corp.
Hygeia, The Health Magazine
Holland-Rantos Company, Inc.
Irradiated Evaporated Milk Institute
Kaustine Company, Inc.
Kellogg Company
Kolynos Company
Lea & Febiger
Lederle Laboratories, Inc.
Lily-Tulip Cup Corporation
The Macmillan Company
Metropolitan Life Insurance Co.
Philip Morris & Company, Ltd., Inc.
National Dairy Council
National Live Stock & Meat Board
Pet Milk Sales Corporation
W. B. Saunders Company
The Sealright Company, Inc.
Sealtest, Inc.
E. R. Squibb & Sons
Vitex Laboratories, Inc.
Wallace & Tiernan Company, Inc.
Westinghouse Mfg. Co.

Association members, health departments, national and local agencies are contributing to the technical exhibit a series of timely and important scientific subjects presented graphically. Among the exhibitors in this section are the

U. S. Public Health Service
Hooper Foundation Medical Centre
Kansas City (Kans.) Health Department
Kansas City (Mo.) Health Department
New York City Health Department
Bishop Clarkson Memorial Hospital
Kansas City Health Conservation Association
New York State Department of Health
American Social Hygiene Association
Missouri State Health Department

Nurse Placement Service

National Organization for Public Health

Nursing

Missouri Public Health Association

Kansas City Children's Bureau

American Association of State Registration

Executives

National Association of Sanitariums, Inc.

Jackson County Medical Society

Arkansas State Board of Health

Iowa State Department of Health

The Commonwealth Fund

American School Health Association

International Society of Medical Health

Officers

National Society for the Prevention of Blindness, Inc.

Yale School of Medicine

University of Pennsylvania School of Medicine

Queensboro Tuberculosis and Health Association

National Institute of Health

There is material in the Health Exhibit, under both technical and commercial auspices, well worth careful examination and study. In order to extract the most of value from their attendance at the Annual Meeting, delegates should budget their time, allocating a goodly share of it to the exhibits.

BOOKS AT THE ANNUAL MEETING

THE Association's Book Service will repeat at Kansas City the exhibit of health books of all publishers to which delegates to the Annual Meeting turn for information about the best and newest of the literature of their field.

No one is under any compulsion to buy. Of course, the Book Service is in the book-selling business, and Mrs. Andrus, the Association's Librarian in charge, will gladly hold your coat while you make out your check if you feel the acquisitive urge that overcomes all book-lovers at the sight of a thousand or more volumes stacked on shelves.

Come to the Book Exhibit and examine the books on display. If you read fast you may be able to get

through several of the more absorbing before the meeting is over. Comfortable chairs will be provided. Your free copy of the 1938 *Bibliography of Health Books* will be on hand for you.

INVITATION FROM CHICAGO TO DELEGATES EN ROUTE TO KANSAS CITY

DR. Herman N. Bundesen, President of the Chicago Board of Health, announces that the Chicago Municipal Social Hygiene Clinic has recently moved into new and spacious quarters at 26th Street and Wabash Avenue. He goes on to say "Our facilities there are far better than anything we have had in this line in the past, comprising separate space for diagnosis, treatment, social service, and educational activities. Also the male patients are examined and treated on a different floor from the female cases."

Dr. Bundesen believes that these new facilities may be of considerable interest to health officers, and he invites members and guests of the Association who pass through Chicago at any time, and particularly on their way to and from Kansas City, to visit the Clinic.

NEW MEMBERS OF A.P.H.A. DUE TO WESTERN BRANCH ACTIVITIES

THE Western Branch of the American Public Health Association conducted a membership campaign in the months preceding its last Annual Meeting. Each of the 17 states, territories and provinces comprising the Branch coöperated with the result that the names of over 200 new members were added to the A.P.H.A. membership roster. Top honors went to the State of Utah which had a gain in membership of almost 150 per cent.

Efforts like this have played an important part in bringing the membership of the Association up to the highest point in its history—over 6,200 on September 1.

PROGRAM OF THE INSTITUTE ON THE PRACTICAL ADMINISTRA- TION AFFAIRS OF THE HEALTH OFFICER

S PONSORED by the International Society of Medical Health Officers, for the benefit of all Officials and Public Health Workers Interested in Public Health Administrative Problems.

Kansas City, Mo.—Monday, October 24, 1938

9:30 A.M. Room 401, Auditorium

Presiding: E. L. BISHOP, M.D., President, and LEON BANOV, M.D., Secretary-Treasurer.

The New Appraisal Form for Public Health Work. W. F. WALKER, DR.P.H.

Practical Application of the Appraisal Form. V. L. ELLICOTT, M.D., DR.P.H.

The Place of the Local Health Department in a National Health Program. C. E. WALLER, M.D.

Effective Use of Federal Aid in the Local Public Health Program (With lantern slides). JOHN L. RICE, M.D.

Behavior of Health Jurisdictions with Respect to Employment of Health Officers. JOSEPH W. MOUNTIN, M.D.

Practical Methods of Developing a "Career Service" in Public Health. WILLIAM E. MOSHER, PH.D.

Practical Points in Securing Adequate Appropriations for Health Departments. WALTER N. KIRKMAN.

The Seasonal Emphasis of Various Health Services. J. N. BAKER, M.D.

2:30 P.M. Second Session, Room 401, Auditorium

Practical Problems of Staff Organization. HUNTINGTON WILLIAMS, M.D.

Budgets and Budget Making. J. W. BASS, M.D.

The Annual Report as a Sales Argument for Adequate Appropriations. WILLIAM H. ENNEIS, M.D.

The "How" of Public Health Education. Practical Points on preparing newspaper interviews, radio talks, health meetings, etc. W. W. BAUER, M.D.

Practical Use of Visual Education in Public Health. H. H. WALKER, C.P.H., PH.D.

Selling the Health Department to the Public by Means of Public Health Education. PHILIP S. BROUGHTON.

Practical Record Keeping. W. VAL SANFORD, M.D.

Practical Uses of Vital Statistics. GEORGE H. VAN BUREN.

6:30 P.M. Dinner Session, Continental Room, Hotel Kansas Citian

Presiding: EDWIN H. SCHORER, M.D., DR.P.H. Toastmaster, E. L. BISHOP, M.D.

My Most Humorous Experience as a Health Officer.

My Most Serious Experience as a Health Officer.

My Most Embarrassing Experience as a Health Officer.

My Most Pleasant Experience as a Health Officer.

"Experience" speakers will be selected from the guests. YOU may be called upon for an experience, so please put on your thinking cap.

New Frontiers of Preventive Medicine. FRANK G. BOUDREAU, M.D.

Fraternal Greetings. REGINALD M. ATWATER, M.D.

A closed session for members only, for election of officers and the conduct of general business will be held immediately following the dinner session. Society members are requested to remain.

1938 HEALTH CONSERVATION CONTESTS

THE Committee on Administrative Practice of the American Public Health Association has announced the 1938 Health Conservation Contests for cities and rural areas. This is the 10th year of the project among cities, and the 5th year of the project among full-time rural areas. They continued to grow during 1937, and give promise of expansion both in the United States and in the Dominion of Canada.

In the 1937 Contests the response among Canadian rural units far exceeded expectations, and already additional rural health units are enrolling and planning to submit fact-finding schedules. The Provinces of Prince Edward Island and New Brunswick have signified their intention of being represented in 1938; all the newly organized health units in the Province of Quebec intend to participate; and it is expected that all the 32 Quebec units enrolled for 1937 will again be in the Contest this year.

The Rural Contests both in the United States and Canada were again underwritten by the W. K. Kellogg Foundation of Battle Creek, Mich., while the City Contest in the United States was supported by the contributions of life insurance companies. Most

gratifying is the wider interest of the life insurance groups and the fact that 26 new companies are now listed as financial supporters of the 1938 Contest.

The Committee on Administrative Practice has enlarged and amended the 1938 fact-finding schedules to give a more clearly defined picture of the health activities carried on and the attainments of the different units, thereby aiding the Grading Committee in the ranking of competing units.

Special competitions for syphilis and tuberculosis control activities are again included. This has provided opportunities for areas to secure recognition for outstanding special work. In the 1937 Contest the best showing along these special lines of health activity was made in those places where the public health program along all recognized lines was best developed and rounded.

After another year of almost continuous field contacts with the competing cities and counties, Dr. James Wallace of the Association staff, who is Field Director for the Health Conservation Contests, pointed out that across the continent these Contests continue to provide the *occasion* for initiating new programs and for accentuating and expanding programs already adopted. He

said that the Contests provide the means of uniting many agencies in the health program and, in particular, the business groups through intimate relationships to chambers of commerce and other business agencies. According to Dr. Wallace, the Contests help to standardize health work but primarily aid in individualizing it and in pointing out and achieving the objectives which are of prime importance to the community. "Every participant in these Contests is a winner," said Dr. Wallace, "because the chief award is in the interest awakened, the information disseminated, and the local accomplishments in public health which result."

New Units are currently enrolling from North Dakota, Washington, North Carolina, Ohio, Oregon, Kentucky, Florida, and the Canadian Provinces. Every city in the United States is eligible to participate and every full-time county or district health unit in the Dominion or the United States.

The cities enrolled for the City Contest in 1937 totalled 264 and the Rural Contest included 276 areas, of which 241 were in the United States and 35 in Canada.

SERODIAGNOSTIC TESTS FOR SYPHILIS

THE Assembly of Laboratory Directors and Serologists, to Consider Means and Methods to Improve and Make More Available Serodiagnostic Tests for Syphilis, will be held under the auspices of the Committee on Evaluation of Serodiagnostic Tests for Syphilis, at Hotel Arlington, Hot Springs National Park, Ark., October 21-22, 1938. Thomas Parran, Surgeon General, U. S. Public Health Service, will be Chairman.

The purpose of this Assembly is to permit free discussion of the means and methods to improve and make more generally available serodiagnostic tests for syphilis.

This meeting is being held at the end

of the week preceding the Annual Meeting of the American Public Health Association. It is hoped that laboratory directors and serologists working in public health, hospital and private laboratories from all over the United States will attend.

An invitation is extended to members of the Laboratory Section of the American Public Health Association.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

WEEK-END hotel reservations at the Elms, Excelsior Springs, Mo., where the Association of Women in Public Health will meet on Sunday, October 23, and Monday, October 24, may be made through the Local Chairman, Miss Rosamond Losh, Children's Bureau, Kansas City, Mo. Single rooms with bath from Saturday afternoon through Monday luncheon \$12.00; two in a room \$9.50 each.

The meeting begins with a tea and informal get-together on Sunday from 4:30 to 6:00. Monday morning an extensive and interesting program is scheduled followed by a luncheon session at 1:00 with addresses by Dr. Frank Boudreau, Dr. Margaret W. Barnard, and Dr. Michael M. Davis. A business session at 3:30 closes the Excelsior Springs events.

At 7:30 Monday evening, a dinner session will be held in the Hotel Muehlebach, Kansas City, to which all are invited.

STATE DIRECTORS OF PUBLIC HEALTH NURSING

A CLOSED meeting for state directors of public health nursing will be held in Room 203 of the Auditorium Monday, October 24, 1938, preceding the annual meeting of the American Public Health Association in Kansas City, Missouri. Hours for the morning session will be 9:00 to 11:00 A.M. The afternoon session will open at 1:00 P.M.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

William E. Alexander, M.D., Memphis, Mo.,
County Health Officer
John M. Allaman, M.D., Central Bldg., St.
Joseph, Mo., Health Officer
Floyd C. Beelman, M.D., 300 S. Broadway,
Wichita, Kans., Sedgwick County Health
Officer
Max E. Blue, M.D., Burkesville, Ky., Cum-
berland County Health Officer
William B. Buckner, M.D., P. O. Box 127,
Albany, Ga., Dougherty County Health
Commissioner
John R. Claussen, M.D., County Court House,
Florence, S. C., County Health Officer
Francis J. Clements, M.D., Stony Creek, Va.,
Sussex County Health Officer
John M. Collins, M.D., State Dept. of Health,
Seattle, Wash., Health Officer Appointee
Robert H. DeJarnette, M.D., Corinth, Miss.,
Director, Alcorn County Health Officer
Edgar A. Dimond, M.D., 303 S Broadway,
Wichita, Kans., Assistant County Health
Officer
Harrison Eilers, M.D., C.P.H., Los Lunas, N.
Mex., District Health Officer
Harry H. Ennis, M.D., C.P.H., District Health
Service No. 1, Le Mars, Ia., Medical
Director
Douglas H. Fryer, M.D., D.P.H., Eutaw, Ala.,
Greene County Health Officer
Elmer E. Gay, M.D., Gay Bldg., Richmond,
Mo., City Health Officer
James H. Gordon, M.D., P. O. Box 747,
Covington, Va., Alleghany-Botetourt Health
Officer
Frank Hedges, M.D., Pattonsburg, Mo.,
Davies County Physician
Rutherford O. Ingham, M.D., Box 175,
Centerville, Ala., Bibb County Health
Officer
Todd W. Keith, M.D., Spring St., Harrisville,
W. Va., Ritchie County Health Officer
H. E. Kely, Lakeview, Ore., Lake County
Health Officer
Donald G. Kilgore, M.D., 505 Medical Arts
Bldg., Dallas, Tex., Highland Park Health
Officer and Medical Director, Republic
National Life Insurance Co.
Reuel Lanting, M.D., 1221 Ludington St.,
Escanaba, Mich., Director, Delta County
Health Dept.
A. Victor Nasatir, M.D., C.P.H., 2633 Etna
St., Berkeley, Calif., Assistant Professor,

Public Health Administration, University of
California

John A. Norton, M.D., 26 Fordonia Bldg.,
Reno, Nev., Director, Local Health Admin-
istration and Epidemiology, State Board of
Health
Maurice L. Peter, M.D., Eastman National
Bank Bldg., Newkirk, Okla., Director, Kay
County Health Unit
Jack B. Porterfield, M.D., Box 455, Williams-
burg, Va., Director, Peninsula Health
District
William H. Riheldaffer, M.D., Box 335, Rom-
ney, W. Va., Director, Eastern Health
District
Frank M. Rogers, M.D., Crittenden County
Health Dept., Marion, Ky., County Health
Officer
Onal A. Sale, M.D., 113 Hickory St., Neosho,
Mo., County Physician
Harold E. Simmonds, M.D., Alamo, Tenn.,
Crockett County Health Officer
Harry A. Simrell, M.D., Stockton, Mo.,
County Physician
Albert E. Small, M.D., 90 W. Emerson St.,
Melrose, Mass., Chairman, Board of Health
Charles M. Smith, M.D., 744 E. 5th St., Provo,
Utah, Health Officer
L. F. Weyerich, M.D., 414 E. Third, Cameron,
Mo., District Health Officer
John Wilson, M.D., Bloomfield, Mo., County
Physician

Laboratory Section

Catherine E. Harris, 2012 N. Ross St., Okla-
homa City, Okla., Serologist, State Health
Dept.
Frances Kelleam, 1937 W. 17, Oklahoma City,
Okla., Technician, State Health Dept.
Mildred M. Moss, 3820 Hill Rd., Little Rock,
Ark., Bacteriologist, and Associate Director,
Hygiene Laboratory, State Board of Health
J. N. Patterson, M.D., State Board of Health,
Jacksonville, Fla., Director of Laboratories
S. Edward Sulkín, 33 Municipal Courts Bldg.,
St. Louis, Mo., Senior Bacteriologist, Health
Dept.

Vital Statistics Section

Oscar F. Maxon, M.D., 800 S. 6 St., Spring-
field, Ill., Medical Director, Franklin Life
Insurance Co.
Harry J. Nestlebusch, City Hall, St. Joseph,
Mo., Clerk, Board of Health

Public Health Engineering Section

Robert C. Hallett, Boydton, Va., Sanitation Officer, Brunswick-Green-Mecklenburg Health District

Charles L. Langshaw, 23 Buttermere Gardens, Purley, Surrey, England, Sanitary Engineer, Metropolitan Police

John H. Ruge, Marianna, Fla., District Sanitary Officer, State Board of Health

David B. Lee, State Board of Health, Pensacola, Fla., Sanitary Engineer, Escambia County Health Dept.

Curtis A. Burdick, Farmerville, La., Sanitarian, State Board of Health

Earl C. Huston, State Board of Health, Topeka, Kans., District Supervisor, U. S. Public Health Service

John J. Costley, Public Health District No. 5, Kingsville, Tex., District Sanitarian

Gustavo A. Bequer Y Herrera, Calle 4 No. 305, Vedado, Havana, Cuba, Assistant Chief Sanitary Engineer, Instituto Tecnico de Salubridad

William D. Staples, C.E., 315 N. 11 St., Temple, Tex., Sanitary Engineer, Bell County Health Unit

Frank B. Wood, 103 Lexington Rd., Montgomery, Ala., Assistant Sanitary Engineer on Malaria Control, State Dept. of Health

N. J. Gilsdorf, Box 7, Cameron, Mo., District Public Health Engineer, State Board of Health

Roy N. Johnston, C.E., State Board of Health, Topeka, Kans., Assistant State Director, U. S. Public Health Service

Charles R. Millard, 1324 Chester, Stillwater, Okla., Sanitarian, Payne County Health Unit

James D. Caldwell, Bureau of Health, Knoxville, Tenn., Director, Division of Sanitation

Joe L. Walker, Court House, Eldorado, Kans., Sanitarian, Butler County Health Dept.

Industrial Hygiene Section

William N. Witheridge, 1151 Taylor Ave., Detroit, Mich., Industrial Hygiene Engineer, Dept. of Health

Morton D. Schweitzer, Ph.D., 3 West 87 St., New York, N. Y.

Food and Nutrition Section

Pearl Rorabaugh, 933 Kansas Ave., Topeka, Kans., Nutritionist, State Board of Health

Vernon K. Watson, 90 Front St., Canajoharie, N. Y., Physiological Chemist and Bacteriologist, Beech-Nut Packing Co.

Child Hygiene Section

Paul R. Ensign, M.D., Sparta, Ga., Pediatrician, Child Health Demonstration

David W. Goltman, M.D., 129 Physicians and Surgeons Bldg., Memphis, Tenn., Director of Infant Hygiene, Health Department

Florence M. Jones, 3706-81 St., Jackson Heights, L. I., N. Y., Research Assistant, School Health Study

Doris A. Murray, M.D., Dr.P.H., Children's Bureau, Dept. of Labor, Washington, D. C., Senior Medical Officer

George M. Wheatley, M.D., 12-26-31 Ave., Astoria, L. I., N. Y., Assistant Director, School Health Study

Public Health Education Section

Bertha H. Campbell, State Board of Health, Topeka, Kans., Educational Director

Loietta H. Grant, R.N., Hill City, Kans., County Public Health Nurse

Myron W. Husband, M.D., 1733 Laramie, Manhattan, Kans., Director, Student Health Service, Kansas State College of Agriculture and Applied Sciences

Beatrice Kresky, 499 Ocean Ave., Brooklyn, N. Y., Volunteer Worker, Committee on Neighborhood Health Development

Public Health Nursing Section

Ruth Botts, Coldwater, Kans., Comanche County Public Health Nurse

Evelyn C. Brown, Court House Annex No. 2, Toms River, N. J., Supervisor, Ocean County Health Dept.

Helen J. Crowe, R.N., Higginsville, Mo., District Health Nurse, State Board of Health

Alice M. Finley, R.N., P. O. Box 802, Dodge City, Kans., Consultant Nurse, State Board of Health

Frances E. Guinn, R.N., 224 N. 9th St., Clinton, Okla., Field Nurse

Elsya S. Hay, Hartville, Mo., Wright County Public Health Nurse

Hazel Higbee, 2110 Cornell Rd., Cleveland, O., Instructor in Public Health Nursing, School of Applied Social Sciences, Western Reserve University

Annabell Horne, R.N., Box 656, Fort Stockton, Tex., Pecos County Health Nurse

Marie L. Johnson, 33 Washington Square, New York, N. Y., Assistant Director, Nursing Bureau, Metropolitan Life Insurance Co.

Katherine L. Laux, 410 Newhouse Bldg., Salt Lake City, Utah, Supervisor, Metropolitan Life Insurance Nursing Service

Velma G. Long, 824 Kansas Ave., Topeka, Kans., Tuberculosis Control Field Nurse, State Board of Health

Hazel L. Loveland, R.N., 634 Taylor, Topeka, Kans., Consultant Nurse, State Board of Health

Mary E. McAuliffe, R.N., 305 Greenwood,

Topeka, Kans., State Supervisory Nurse, State Board of Health
 Alice E. Moody, R.N., 952 Pelhamdale Ave., Pelham Manor, N. Y., Westchester County Health Nurse
 Margaret N. Murphy, 519 Dexter Ave., Montgomery, Ala., Advisor in Midwife Control, State Health Dept.
 Gladys M. Schuerman, R.N., 9th & Walnut Sts., Rocky Ford, Colo., Supervisory Nurse, Otero County Health Unit
 L. Elise Smith, R.N., State Board of Health, Jackson, Miss., Public Health Nurse
 Euphrosine Staab, R.N., Box 82, Sublette, Kans., Public Health Nurse, State Board of Health
 Edith M. Stanforth, R.N., Ulysses, Kans., County Public Health Nurse
 Daisy Stuart, R.N., District Health Office, Cameron, Mo., Public Health Nurse
 Emma H. Taliaferro, R.N., Tuckahoe Apts., Richmond, Va., Orthopedic Nurse, State Dept. of Health
 Esther N. Walraven, R.N., Children's Bureau, Dept. of Public Assistance, Charleston, W. Va., Supervisor, Orthopedic Nurses Division, Crippled Children
 Sue Wilson, R.N., Court House, Boonville, Mo., County Nurse, State Board of Health

Epidemiology Section

Bascom Johnson, Jr., M.D., Box 315, Pleasantville, N. Y., Epidemiologist-in-training, State Dept. of Health
 William Mosley, M.D., D.P.H., 269 Soudan Ave., Toronto, Ont., Canada, Clinical Specialist, Provincial Dept. of Health
 Evelyn F. H. Rogers, M.D., State Dept. of Health, Albany, N. Y., Epidemiologist-in-training, State Dept. of Health
 Milton Trautmann, M.D., C.P.H., State

Capitol, Madison, Wis., Venereal Disease Control Officer, State Board of Health
 Willard H. Wright, D.V.M., Ph.D., National Institute of Health, Washington, D. C., Senior Zoölogist and Acting Chief, Division of Zoölogy

Unaffiliated

Alan Blanchard, 45 Second St., San Francisco, Calif., Field Representative, Western States Division, American Social Hygiene Association
 Pearson D. Brooker, D.D.S., State Board of Health, Columbia, S. C., Director of Dental Health
 Sadie D. Clarke, Horry County Health Dept., Conway, S. C., County Nurse
 Helen M. Hall, 713 Clifton Ave., Redlands, Calif., Medical Social Worker, State Dept. of Health
 Frank W. Kenney, M.D., Capitol Life Insurance Co., Denver, Colo., Medical Director
 L. H. Lee, M.D., 523 W. 6 St., Los Angeles, Calif., Medical Director, Pacific Mutual Life Insurance Co.
 George McLean, M.D., 109 E. Redwood St., Baltimore, Md., Medical Director, Sun Life Insurance Company of America
 Henrietta Mellow, 810 W. 49 St., Los Angeles, Calif., Medical Social Worker, State Dept. of Public Health
 Martin I. Olsen, M.D., Insurance Exchange Bldg., Des Moines, Ia., Vice-President and Medical Director, Central Life Assurance Society
 Reuben Rapaport, M.D., 510 W. 112 St., New York, N. Y., General Practitioner
 Joseph Travenick, Jr., M.D., 1590 4 Ave., N., Nashville, Tenn., Medical Director, Life and Casualty Insurance Company of Tennessee

APPLICANTS FOR FELLOWSHIP

(Other names listed in August Journal)

In accordance with the By-laws the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility and the Governing Council will take place between now and the time of the Kansas City Annual Meeting.

Health Officers Section

James I. Bowman, M.D., Health Officer, Montgomery County, Montgomery, Ala.
 David D. Carr, M.D., C.P.H., Director, Division of Venereal Disease Control and Local Health Administration, State Board of Health, Salt Lake City, Utah
 Franklin M. Foote, M.D., Dr.P.H., Chief,

Local Health Administration, State Department of Health, Hartford, Conn.
 Frank K. Harder, M.D., Acting Health Officer, Cincinnati, O.
 Marvin F. Haygood, M.D., C.P.H., Deputy Commissioner and Director, Local Health Service, State Department of Health, Des Moines, Ia.

John L. Jones, M.D., Dr.P.H., State Health Commissioner, Salt Lake City, Utah
 Joseph H. Kinnaman, M.D., C.P.H., Assistant Health Commissioner, Peoria, Ill.
 Bryan Newsom, M.D., C.P.H., Epidemiologist, Health Department, Seattle, Wash.
 Howard A. Orvis, M.D., M.S.P.H., Health Officer, Winnetka and Kenilworth, Winnetka, Ill.
 William P. Richardson, M.D., C.P.H., Health Officer, Orange-Person-Chatham District Health Department, Chapel Hill, N. C.
 William H. Runcie, M.D., Deputy Health Commissioner, Nassau County Department of Health, Mineola, N. Y.
 Richard O'B. Shea, M.D., M.P.H., Health Officer, Bridgeport, Conn.
 Adolph Weinzirl, M.D., C.P.H., City Health Officer, Portland, Ore.
 Robert B. Wolford, M.D., Director, Public Health District No. 2, Mineral Wells, Tex.

Laboratory Section

Margaret I. Beattie, M.A., Gr.P.H., Assistant Professor of Public Health, University of California, Berkeley, Calif.
 E. H. Bramhall, B.S., Director of Laboratories, State Board of Health, Salt Lake City, Utah
 Lawrence J. Peterson, B.S., Director of Laboratories, Idaho Division of Public Health, Boise, Ida.

Vital Statistics Section

Thomas W. Chamberlain, Director, Bureau of Vital Statistics, State Board of Health, Jefferson City, Mo.
 Elizabeth Parkhurst, M.S., Senior Statistician, State Department of Health, Albany, N. Y.

Industrial Hygiene Section

Leopold Brahdy, M.D., Physician-in-Charge, Workmen's Compensation, New York, N. Y.
 Arthur G. Cranch, M.D., Head, Industrial Toxicology Department, Union Carbide Co., New York, N. Y.
 Herbert G. Dyktor, Chief Industrial Hygiene Engineer, Health Division, St. Louis, Mo.

Child Hygiene Section

Robert W. Ball, M.D., C.P.H., Director, Maternal and Child Health Division, State Board of Health, Columbia, S. C.
 Sarah S. Deitrick, M.D., C.P.H., Regional Medical Consultant, Children's Bureau, Washington, D. C.
 Katharine F. Lenroot, LL.D., Chief, Children's Bureau, Washington, D. C.
 Abram L. Van Horn, M.D., Assistant Director, Crippled Children, Children's Bureau, Washington, D. C.

Public Health Education Section

James G. Stone, Executive Secretary, Los Angeles Tuberculosis and Health Association, Los Angeles, Calif.
 Savel Zimand, Assistant Director, Public Health Education, Department of Health, New York, N. Y.

Public Health Nursing Section

Henrietta W. Bonheyo, R.N., Territorial Supervisor, Southern Territory, Metropolitan Life Insurance Company, New York, N. Y.
 Eula B. Butzerin, R.N., M.S., Associate Professor, Department of Nursing Education, University of Chicago, Chicago, Ill.
 Loneta M. Campbell, R.N., Director, Visiting Nurse Association, Cincinnati, O.
 Bess E. Dalton, R.N., B.S., Supervising Nurse, Forsyth-Stokes-Yadkin-Davie Health District, Winston-Salem, N. C.
 Florence W. Englesby, R.N., Chief Consultant of Nurses, State Board of Health, Pierre, S. D.
 Laurene C. Fisher, R.N., Director, Public Health Nursing, State Department of Health, Charleston, W. Va.
 Grace Frauens, R.N., M.S., Director, St. Joseph Organization for Public Health Nursing, St. Joseph, Mo.
 Lalla M. Goggans, R.N., Field Nurse, Mobile Health Unit, State Board of Health, Jacksonville, Fla.
 Fern A. Goulding, R.N., Assistant Professor of Hygiene, Iowa State College, Ames, Ia.
 Ann M. Hellner, R.N., M.A., Director, Visiting Nurse Association, Bridgeport, Conn.
 Virginia A. Jones, R.N., Assistant Director, National Organization for Public Health Nursing, New York, N. Y.
 Louise Knapp, R.N., A.M., Professor of Nursing and Director, Department of Nursing Education, Wayne University, Detroit, Mich.
 Kathleen M. Leahy, R.N., M.S., Assistant Professor of Nursing Education, University of Washington, Seattle, Wash.
 Carrie E. Lewis, R.N., Assistant Director of Nurses, Division of Health, Cleveland, O.
 Emma Maurin, R.N., Director, Division of Public Health Nursing, State Board of Health, New Orleans, La.
 Marian G. Randall, R.N., B.S., Assistant Director in Charge of Records and Studies, Henry Street Visiting Nurse Association, New York, N. Y.
 Emilie G. Robson, R.N., Executive Director, Visiting Nurse Association, St. Louis, Mo.
 Clara B. Rue, R.N., B.S., Director, Course in Public Health Nursing, Duquesne University, Pittsburgh, Pa.

Mildred T. Sanderson, B.S., Director, Municipal Visiting Nurses, St. Louis, Mo.
Lona L. Trott, R.N., B.S., Acting National Director, Public Health Nursing and Home Hygiene and Care of the Sick, American Red Cross, Washington, D. C.
Abbie R. Weaver, R.N., M.S., Director, Division of Public Health Nursing, State Department of Health, Atlanta, Ga.
Lucy G. White, M.A., Director, Public Health Nursing Course for Graduate Students, Vanderbilt University School of Nursing, Nashville, Tenn.

Epidemiology Section

Charles F. Church, M.D., Epidemiologist, State Board of Health, Helena, Mont.
John E. Gordon, M.D., Ph.D., Professor of Preventive Medicine and Epidemiology, Harvard Medical School, Boston, Mass.
Elmer R. Pascoe, M.D., Epidemiologist,

Health Section, Board of Education, Los Angeles, Calif.
Unaffiliated
Sidney W. Bohls, M.D., Director of Laboratories, State Department of Health, Austin, Tex.
Mary A. Hodge, M.D., Professor of Hygiene, Goucher College, Baltimore, Md.
Richard R. C. Leonard, D.D.S., Chief, Division of Oral Hygiene, State Department of Health, Baltimore, Md.
Abraham J. Levy, M.D., Dr.P.H., District Health Superintendent, State Department of Health, Chicago, Ill.

DECEASED MEMBERS

Samuel M. Creswell, M.D., Tacoma, Wash., Elected Member 1931, Fellow 1934
Lloyd Moffitt, M.D., Yakima, Wash., Elected Member 1931, Fellow 1933
Mary Lucier, New York, N. Y., Elected Member 1936

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Nurse Placement Service, 8 South Michigan Avenue, Chicago, Ill., with which the Association coöperates.
Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS WANTED

HEALTH OFFICERS

Physician, M.D., St. Louis University; post-graduate in eye, ear, nose and throat; 10 years' experience in public health administration as director of county health units and epidemiologist with state department; also experienced in welfare administration, prefers administrative public health position in central or western state. Excellent references. A373
Physician. M.D.. McGill; C.P.H., Johns Hopkins; excellent background of communicable disease control and school health service, seeks position as epidemiologist or public health administrator. A368
Experienced health officer: M.D.. Class A medical school; completed Vanderbilt short course for Health Officers, 1936; will consider appointment. A320
Physician, M.D., Class A medical school; M.P.H., Harvard School of Public Health; extensive experience in pediatrics and school medical services; also background of county health administration and teaching in medical school; will consider expanded opportunity in teaching or research. A302

Physician, age 34; M.D., University of Wisconsin; M.P.H., Harvard; specializing in industrial hygiene, will consider general administration. A342
Physician, M.D., University of Cincinnati; with postgraduate training in venereal disease control, Johns Hopkins; now employed, is available as venereal disease control officer. A363
Well qualified physician, with C.P.H. from Johns Hopkins; experienced as school physician and in college teaching, will consider city or county administrative position or teaching and student health service. A383
Physician with Dr.P.H. degree, experienced as a local health officer, in present position since 1929, will consider opening. A386
Physician, A.B., M.D., 30 years in a large city health department. Administrative, educational and research experience; also familiar with venereal disease work. A295

HEALTH EDUCATION

Woman, well qualified in health education, wishes position as health coördinator or health counsellor. Has wide experience, and Ph.D. from New York University. M236

Young woman, M.A., Health Education, Teachers College, Columbia University; with splendid international experience, seeks position as director of health education with preference for New York City. H369

Young man, M.S.P.H., University of Michigan; at present college teacher of hygiene and physical education and experienced in university medical service, desires position as executive in public or private health organization. H357

Woman, M.D., Boston University; special work Columbia and Massachusetts Institute of Technology; 1 year's experience in state hospital; interested in psychiatry, desires position in the East in hospital for mental diseases or industrial school. H247

Young woman, M.S.P.H., University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. H303

LABORATORY

Experienced laboratory director with background of dairy products manufacture and research in control methods; University of Wisconsin, M.S. and Ph.D.; desires administrative position with food manufacturing or processing industry, or association with health department doing routine and research work in food control. L381

Experienced bacteriologist with teaching in research background, seeks position as director of laboratory. L370

Bacteriologist and pathologist with wide administrative experience; Ph.D., Brown University; will consider leading position in his field. L371

Laboratory technician; B.Sc. degree; with experience in Army, state public health laboratory, and U. S. Public Health Service field laboratory, seeks position in medical school or university. L379

Young woman, M.A. in medical bacteriology, University of Wisconsin, 7 years' experience in a state laboratory of hygiene, desires posi-

tion in bacteriological diagnosis, research or a combination of the two. L387

Young woman, A.B., major in bacteriology; 9 years' experience; now employed in a clinical laboratory desires position in bacteriology or serology in a health department laboratory or in research. L382

Bacteriologist, college graduate, special postgraduate work, 9 years' public health laboratory experience in executive, routine and research work, desires to change position. Excellent references. L385

SANITARY ENGINEERING

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology, experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. E380

Experienced sanitary engineer, graduate of Massachusetts Institute of Technology, seeks responsible position. E372

MISCELLANEOUS

Experienced public health nurse executive, Fellow of the A.P.H.A., is available for responsible position. N384

Experienced teacher in bacteriology and public health; Ph.D., Cornell; now professor in Grade A medical school, will consider teaching, executive or administrative position. M327

Physician, graduate of Johns Hopkins Medical School, and well qualified in medicine and tuberculosis, will consider a clinical position in the medical field. M377

Dentist, graduate of Temple University, with excellent postgraduate experience, desires position in administrative aspects of dental hygiene. M352

Woman physician, graduate of University of Iowa, who has directed State bureau of maternal and child health, now employed, will consider another position. C318

NEWS FROM THE FIELD

PUBLIC HEALTH AND SOCIAL SECURITY

THE U. S. Public Health Service, on the third anniversary of the adoption of the Social Security Act by Congress, pointed out the marked increase in public health facilities resulting from funds provided for this purpose.

Under the provision of \$8,000,000 annually for the stimulation of public health activities in state and local governments through the Public Health Service, there were listed the following advances:

The training of 4,300 medical officers, engineers, nurses, sanitation officers, laboratory workers, and others in public health work. An increase from 667 to 1,116 in the number of counties in the country served by full-time public health officers. In 6 states all areas are covered with full-time units, as compared with 3 before the Act became effective. In 24 states there are separate divisions of venereal disease control, in place of 13 three years ago, and the number of states employing a full-time venereal disease control officer has increased from 9 to 30.

Increases were reported from 35 to 44 in the number of states having separate divisions for preventable diseases; from 16 to 31 in the number having divisions for local health administration; from 20 to 32 in the number having divisions for public health nursing; from 3 to 15 in the number specializing in industrial hygiene; from 8 to 17 specializing in dental hygiene; from 16 to 21 in public health education; and from 13 to 17 in tuberculosis control.

It was pointed out that gains also have been recorded in the attention given to cancer control, malaria control, the control of rodent plague, and in

laboratory service. Most of the federal appropriations under the Act for maternal and child health are administered by the Children's Bureau of the Department of Labor.

During the current fiscal year, the funds from the Social Security Act are being allotted for 22 different health activities in the states. For some of these purposes states must match the federal grants on a basis equitably worked out through conferences with the state health officers and the Surgeon General of the U. S. Public Health Service.

VENEREAL DISEASE CONTROL ALLOTMENTS

THE U. S. Public Health Service has announced that allotments to the states under the Venereal Disease Control Act of 1938 have been made on the basis of population, financial need, and the scope of the venereal disease problems, as provided in the Act. These funds must be supplemented by the States under regulations laid down by the Surgeon General. Of the \$3,000,000 appropriated, \$2,400,000 will be distributed to the states and the remaining \$600,000 will be reserved by the Public Health Service for research and investigation, education and administrative expenses.

OHIO VENEREAL DISEASE PROGRAM

IT is announced, by Walter H. Hartung, M.D., Ohio State Health Director, that the State Health Department is starting a drive against venereal diseases, the program to be financed by state and federal funds. The plan is to expand venereal disease clinics in the larger cities by increasing the number of physicians, technicians, and clerks.

DELAWARE RIVER POLLUTION CONTROL

A RECIPROCAL agreement to correct and control stream pollution within the Delaware River Drainage Basin has been entered into by the 4 states of New York, New Jersey, Pennsylvania, and Delaware. The agreement was prepared under the auspices of the Interstate Commission on the Delaware River Basin and was formally ratified and made operative by the Departments of Health of the 4 states.

Minimum requirements relating to sewage, industrial waste, and other artificial polluting matter have been established. Because of the variable factors of location, size, character, and flow, and the many varied uses of the water of the Delaware River, the stream has been divided into 4 zones and minimum requirements have been drafted to meet the conditions of each zone. No sewage, industrial waste, or other polluting matter may be discharged into the river unless it has been so treated as to produce an effluent which will meet the minimum standards set up by the terms of the agreement.

LEAGUE COMMITTEE ON HEALTH INDICES

A COMMITTEE on Health Indices of the Health Committee of the League of Nations has been appointed to study further the problem of schedules for indices so that the state of health of a given area may more readily be determined.

Reginald M. Atwater, M.D., Executive Secretary of the American Public Health Association, has been appointed a member of the Committee which will meet in Geneva, October 8-11. Other members of the committee include Dr. M. Greenwood, Professor at the London School of Hygiene and Tropical Medicine; Dr. J. Tomcsik, Director of the State Institute of Hygiene, Budapest; Dr. M. Kacprzak, Chief of the Service of Health Statistics, at the State Insti-

tute of Hygiene, Warsaw, and Dr. A. Höjer, Director General of the Health Services of Sweden.

INTERNATIONAL NOMENCLATURE OF DISEASES

THE United States Government has designated representatives to attend the Paris meeting, beginning October 3, of the International Commission for the Decennial Revision of the International Nomenclature of Diseases. George H. Van Buren, Secretary, Jessamine S. Whitney, Dr. Halbert L. Dunn, Thomas J. Duffield, Dr. W. J. V. Deacon, and Dr. George Baehr. The above persons are members of the Sub-Committee on Accuracy of Certified Causes of Death of the American Public Health Association. In addition, Dr. Edwin F. Daily of the Children's Bureau, Selwyn D. Collins, Ph.D., and W. Thurber Fales, Sc.D., have been designated.

PROTEST OF MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

THE Massachusetts Public Health Association has passed a resolution of protest against the report of the National Health Officers Qualifying Board to the United States Conference of Mayors, which was published in the *Journal* for January, 1938, pages 110-111.

The resolution points out that experience in the United States is rich in the demonstrated fact that non-medical health officers as well as medical health officers have administered public health work with outstanding success when they are adequately prepared by training, experience, and personality for the conduct of such work; pointing further to the fact that non-medical scientifically trained public health workers, skilled in engineering, bacteriology, chemistry, physics, sanitation, vital statistics, nutrition, public health education, and other scientific but non-

medical pursuits, have shown administrative ability and success.

The Massachusetts Association records its opposition to the report of the National Health Officers Qualifying Board to the United States Conference of Mayors in so far as the report excludes properly trained and otherwise qualified non-medical public health workers from serving as health officers.

The resolution stipulates that, in so far as this report recognizes the importance of adequate public health training and experience as prerequisites for qualified and efficient public health administrative work, the report has the hearty approval and endorsement of the Massachusetts Public Health Association.

RED CROSS NURSING SERVICES UNDER ONE HEAD

THE various nursing services of the American Red Cross are being unified and Mary Beard, R.N., who since 1924 has been Associate Director of the International Health Division of the Rockefeller Foundation, has been appointed national Director of the Service. Virginia Dunbar, R.N., Assistant Director of the University of California School of Nursing at San Francisco, has been appointed Assistant Director. Both Miss Beard and Miss Dunbar assume their new duties October 1.

Ida F. Butler, R.N., who has been identified with the Red Cross Nursing Service for more than 20 years, and who has been Director of Nursing Enrollment since 1936, retires from active service this fall.

LESLIE DANA MEDAL

THE National Society for the Prevention of Blindness has announced that the Leslie Dana Gold Medal, awarded annually for outstanding achievements in the prevention of blindness and the conservation of vision, has been presented this year to Dr. Ellice

M. Alger, Professor of Ophthalmology and hospital surgeon at the New York Post Graduate Medical School.

NEW YORK SOCIETY OF TROPICAL MEDICINE

DR. Philip Manson-Bahr, Lecturer at the London School of Hygiene and Tropical Medicine and Physician to the Hospital for Tropical Diseases, Endsleigh Gardens, London, was guest speaker at a meeting of the New York Society of Tropical Medicine, at the New York Hospital, September 30.

He spoke on Tropical Sprue.

BRITISH MATERNAL AND INFANT MORTALITY

WALTER ELLIOT, British Minister of Health, has announced the lowest maternal mortality rate in England and Wales in history. A rate of 3.1 per 1,000 births places Great Britain among the nations with the lowest national records; and the infant mortality rate of 58 per 1,000 births compares with the lowest on record for Great Britain of 57 in the year 1935.

Commenting on a slight increase in the deaths from tuberculosis, Mr. Elliot said: "We cannot afford to lose every year nearly 30,000 persons from tuberculosis and nearly 70,000 from cancer, nor can we view with complacency the loss of nearly 2,000 mothers and more than 35,000 children under the age of one.

PERSONALS

Central States

DR. BERT ANDERSON, of Victoria, Kans., has been appointed a member of the Kansas State Board of Health, for a term of 3 years.

MORLEY B. BECKETT, M.D.,[†] of Allegan, Mich., who recently resigned as County Health Officer, will continue as Director of the Allegan and Van Buren County units.

[†] Member A.P.H.A.

DR. WALLACE E. CHILDS, of Madison, Ind., was appointed, July 1, Director of District Health Unit No. 1, consisting of Gibson, Pike, Posey, and Warrick Counties.

JAMES A. DOLCE, M.D.,† of Charlotte, Mich., has been appointed Assistant Director and County Health Officer of Allegan County.

OTTO K. ENGELKE, M.D., has assumed his duties as Health Commissioner of Adams County, Ohio, where he will reorganize the county health department.

D. CLARE GATES, DR.P.H.,† formerly Field Secretary of the Michigan Joint Committee on Health Education, Ann Arbor, Mich., has been appointed Director of Health Education, North Dakota State Department of Health, Bismarck, N. D., effective August 15.

JOSEPH H. KINNAMAN, M.D.,† of Baltimore, Md., has been appointed Assistant Health Commissioner of Peoria, Ill., with supervision of school health activities, effective August 15.

L. F. HALL, M.D., formerly Health Commissioner of Cuyahoga County, Ohio, has been appointed Commissioner of Health of the City-County Health Department of Helena, Mont., effective September 1.

WALTER H. HARTUNG, M.D., Ohio State Health Director, announces that the State Health Department is starting a drive against venereal diseases, the program to be financed by state-federal funds. The plan contemplates expanding venereal disease clinics in the larger cities by increasing the number of physicians, technicians, and clerks.

BENJAMIN LIEBERMAN, M.D.,† has resigned as Director of School Hygiene in the Milwaukee, Wis., Health Department, to become Director of Health Service at the Milwaukee State Teachers' College.

ROBERT A. LIGHTBURN of Crestline,

Ohio, has been appointed to the position of health education secretary and general assistant on the staff of the Onondaga, N. Y., Health Association. Mr. Lightburn was formerly connected with the Ohio Public Health Association.

CLIFTON C. E. MERRITT, M.D.,† of Iron Mountain, Mich., has resigned as Health Officer of Dickinson County, to succeed RAGNAR T. WESTMAN, M.D.,† as Director of the Bay County Department of Health, Bay City, Mich.

DR. ROSCOE T. NICHOLS, of Hiawatha, Kans., has been appointed a member of the Kansas State Board of Health, for a term of 3 years.

RUSSELL E. PLEUNE, M.D.,† of Lansing, Mich., formerly in charge of the Bureau of Venereal Disease Control for the Michigan State Department of Public Health, has been named Director of the Dickinson County health unit, effective September 1. He succeeds CLIFTON E. MERRITT, M.D.†

DR. ALBERT W. RATCLIFFE has been appointed Assistant to DR. CLYDE G. CULBERTSON, Chief of the Bureau of Bacteriology and Pathology of the Indiana State Department of Health.

LEWIS C. ROBBINS, M.D., C.P.H.,† of Indianapolis, Ind., has been appointed Acting Chief of the Bureau of Local Health Administration of the Indiana State Department of Health, during the absence of JOHN W. FERREE, M.D.,† Chief of the Bureau, who begins a year's graduate work at Johns Hopkins University September 1.

OSCAR D. SCHWARTZ, M.D.,† of Detroit, Mich., has been appointed Assistant Director of the Social Hygiene Division of the Detroit Department of Health.

* Fellow A.P.H.A.

† Member A.P.H.A.

H. J. SHAUGHNESSY, Ph.D.,† formerly chief of the Laboratory Service of the Illinois State Department of Health, who during the last year has been a member of the Department of Bacteriology and Public Health at the University of Colorado School of Medicine at Denver, has resigned to resume his former work in Illinois.

V. K. VOLK, M.D.,* of Saginaw, Mich., was recently appointed to fill the newly created position of Medical Superintendent of Saginaw County Hospitals; he is also Health Officer of the County.

ROY B. WEATHERED, M.D.,† of Kansas City, Mo., will succeed LAWRENCE F. STEFFEN, M.D., of El Dorado, Kans., as Health Officer of Butler County.

RAGNAR T. WESTMAN, M.D.,† of Bay City, Mich., has resigned as Director of the Health Department of Bay County.

Eastern States

HENRY D. CHADWICK, M.D.,* Commissioner of Public Health in the Commonwealth of Massachusetts since 1933, has resigned, effective September 1, to accept the position of Medical Director and Assistant Superintendent of the Middlesex County Sanatorium in Massachusetts.

CHARLES F. CHURCH, M.D.,† who for 3 years has been Director of Research of the Rockefeller Nutrition Fund at the Children's Hospital, Philadelphia, Pa., and associate in the Department of Pediatrics, University of Pennsylvania, will resume his work at the School of Public Health, University of Michigan, Ann Arbor, after visiting state departments of health during the summer in New York, Tennessee, Kentucky, and Michigan.

VICTOR G. HEISER, M.D.,* who until recently was an Associate Director of the International Health Division of the Rockefeller Foundation, has

been appointed Research Director of the Committee on Healthful Working Conditions of the National Association of Manufacturers, New York, N. Y. It has been announced that a survey of plant conditions will be started and that an information service will be provided for more than 75,000 factories, each of which employs from 25 to 2,000 workers. DONALD M. SHAFER, M.D., formerly of the Medical Department, Standard Oil Company of New Jersey, will be associated with Dr. Heiser.

ERNEST NEWMAN, M.D., C.P.H.,† who for 7 years has been employed as diagnostician in the Bureau of Preventable Diseases, New York City Department of Health, has been appointed Director of the Marathon County Health Unit at Wausau, Wis.

Southern States

DR. NOEL M. AKERS, of Macon, Ga., has been appointed Health Commissioner of Emanuel County.

THOMAS H. BLAKE, M.D.,† of Charleston, W. Va., Director of the Division of Maternal and Child Hygiene, has been named Director of County Health Work of the State Department of Health, succeeding ALBERT M. PRICE, M.D.†

EARL P. BOWERMAN, M.D.,† of Trenton, Tenn., has been named Health Officer of Gibson County.

DR. JOSEPH LINDSAY COOK, of Winston-Salem, Assistant County Health Officer and Medical Superintendent in charge of the Forsyth County Hospital, has resigned to take charge of a syphilis control program in Guilford County, N. C.

WARREN F. DRAPER, M.D.,* Washington, D. C., Assistant Surgeon General, U. S. Public Health Service, and recently Chief of the Division of Personnel and Accounts, has been ap-

* Fellow A.P.H.A.

† Member A.P.H.A.

pointed as the first incumbent of the newly created position of Executive Officer of the U. S. Public Health Service. Dr. Draper, who is a graduate of the Harvard Medical School, has been identified with the Service since 1910 and has had a wide variety of experience in many aspects of public health. For several years prior to 1934, Dr. Draper served as State Health Officer of Virginia.

J. W. ERWIN, M.D.,† of Savannah, Tenn., Health Officer of Hardin County, has been appointed Health Officer of Giles County, Tenn., to succeed DR. WILFRED N. SISK, of Pulaski, who is taking a course in venereal diseases at Johns Hopkins University School of Medicine, Baltimore, Md.

DR. THOMAS K. FAIREY, of Johnston, S. C., has been appointed Health Officer of Union County.

DR. BENJAMIN F. HAND, JR.,‡ formerly of Waynesboro, Miss., has been appointed itinerant Health Officer for the Mississippi State Board of Health, to aid county health officers in the examination of preschool children.

DR. ISAAC F. HUDSON is the new Health Officer of Stamford, Tex., succeeding the late DR. NATHAN H. BICKLEY.

LAWRENCE KOLB, M.D., formerly Chief of the U. S. Public Health Service Hospital at Lexington, Ky., has been appointed Assistant Surgeon General in charge of the Division of Mental Hygiene of the Service, succeeding WALTER L. TREADWAY, M.D.

DR. JAMES L. MIMS, of Chester, S. C., has been appointed Health Officer for Jasper County, succeeding DR. JOHN B. WALLACE, of Fountain Inn, who resigned to return to private practice.

THOMAS W. NALE, M.D.,† of Charleston, W. Va., Assistant Director of the Division of Maternal and Child Hygiene of the State Department of Health, has been named Director, to succeed THOMAS H. BLAKE, M.D.†

ALBERT M. PRICE, M.D.,† of Charleston, W. Va., formerly Director of County Health Work in the State Department of Health, has been appointed collaborating epidemiologist and Director of the Division of Communicable Diseases.

DR. DON PRICE, Secretary of the Henderson County Medical Society, has been named Health Officer of Athens, Tex., to succeed DR. JOHN K. WEBSTER.

DR. W. T. RAINEY, formerly of Brownsville, Tenn., has been appointed Health Officer of Lake County, succeeding DR. JAMES P. MOON, of Tiptonville, who is to become a member of the unit in Dyer County.

GUY V. RICE, M.D.,† of Chillicothe, Tex., has been appointed Health Commissioner of Wayne County.

DR. GASTON W. ROGERS, U. S. Army Medical Corps, retired, has been appointed Assistant District Health Officer on a full time basis in charge of Chatham, Person, and Orange Counties, with headquarters in Pittsboro, N. C.

DR. BENJAMIN A. STAFFORD, JR., formerly of Temple, Tex., has been appointed Health Officer of the Sharkey-Issaquena County Unit, succeeding DR. ROBERT H. DEJARNETTE, who was transferred to Alcorn County. Sharkey and Issaquena Counties made joint appropriations for a combined full time health unit with centers in each county.

SENIOR SURGEON PAUL M. STEWART, Washington, D. C., for the past 3 years Medical Director of the U. S. Employees' Compensation Commission, has been appointed Assistant Surgeon General in charge of the Division of Personnel and Accounts, to succeed WARREN F. DRAPER, M.D.*

* Fellow A.P.H.A.

† Member A.P.H.A.

DR. RICHARD M. STREET, M.D.,† of Laurens, S. C., recently resigned as Health Officer of Abbeville and Laurens Counties.

DR. ROBERT W. TAYLOR, of Lufkin, Tex., has been appointed Health Officer of Lufkin, succeeding DR. DENMAN C. HUCHERSON, resigned.

WALTER L. TREADWAY, M.D., recently Assistant Surgeon General in charge of the Division of Mental Hygiene in the U. S. Public Health Service, Washington, D. C., has been transferred as Medical Officer in charge of the U.S.P.H.S. Hospital in Lexington, Ky., to succeed LAWRENCE KOLB, M.D.

Western States

DR. ADOLPH FRANK BREWER, of Redwood City, Calif., has been appointed Health Officer of Solano County. New full time health units were organized for Solano and Sonoma Counties, effective July 1.

His Majesty, the King of Italy and Emperor of Ethiopia has conferred the Cross of Cavaliere of His Order of the Crown of Italy upon J. C. GEIGER, M.D.,* Director of Public Health of the City and County of San Francisco, Calif., "for services of distinction in the field of public health."

BENJAMIN L. GRIMES,† of Juneau, Alaska, has resigned as Territorial Sanitary Engineer of Alaska, to accept a position with the Oregon State Board of Health, Portland, under CARL E. GREEN,† State Sanitary Engineer.

DR. FRANCIS J. PETER has been appointed Health Officer of Turlock, Calif., succeeding DR. CHARLES E. PEARSON.

DR. PAUL W. SCHRIER has been appointed Health Officer of Atwater, Calif., succeeding DR. CLARENCE C. FITZGIBBON, of Merced. Dr. Fitz-

gibbon is Health Officer of Merced County.

DR. FRANK E. SOHLER, JR., has been appointed Health Officer of Cloverdale, Calif., succeeding DR. DONOVAN C. OAKLEAF.

DR. BURTON L. ZINNAMON,† of San Francisco, Calif., has been appointed Health Officer of Sonoma County, effective July 1. The unit was recently placed on a full time basis.

Puerto Rico

EDUARDO GARRIDO-MORALES, M.D., Dr.P.H.,* Commissioner of Health of San Juan, Puerto Rico, had the honorary degree of Doctor of Science conferred upon him by Louisiana State University on July 28. Dr. Garrido-Morales is a graduate of the University of Virginia School of Medicine and a Doctor of Public Health degree from Johns Hopkins University.

Foreign

SILVESTRE LÓPEZ PORTILLO, M.D., M.P.H.,† after obtaining his C.P.H. degree in Boston, Mass., was recently appointed State Health Officer of San Luis Potosí, S. L. P., Mexico. He succeeds FELIPE MALO JUVERA, M.D.,† who is now going to study at the School of Public Health, Johns Hopkins University, Baltimore, Md.

SIR ARTHUR NEWSHOLME,* late Principal Medical Officer of the Local Government Board, was presented with the Jenner Medal of the Royal Society of Medicine, London, at a recent general meeting of the Fellows of the Society. The medal is awarded "for distinguished work in epidemiological research or for pre-eminence in the prevention and control of epidemic disease."

* Fellow A.P.H.A.

† Member A.P.H.A.

K. S. VISWANATHAN, M.D., M.P.H.,† has sailed for India after a year spent at the Harvard School of Public Health where he received the Master's degree. He is the Assistant Professor of Hygiene at the Madras Medical College in India.

DEATH

I. MALINDE HAVEY, R.N.,* National Director of Public Health Nursing and Home Hygiene for the American Red Cross, Washington, D. C., died September 7, at the Baker Memorial Hospital, Boston, aged 51. She was buried with national honors in Arlington Cemetery, Washington. Miss Havey was in charge of disaster work during the 1927 Mississippi

flood, and the Mississippi and Ohio River floods of 1937. As a nurse during the World War she was twice decorated by the British and French Governments for bravery under fire. Appointed Director of the Public Health Nursing Service more than 12 years ago, she directed Red Cross nursing activities for a time in the New England flood of 1936. Miss Havey, who was born in Stoughton, Wis., and trained in nursing at the Chicago Hospital, made her home in Washington. She became a member of the Association in 1922, and had been a Fellow since 1932.

* Fellow A.P.H.A.

† Member A.P.H.A.

CONFERENCES AND DATES

American Association of School Health. Kansas City, Mo. October 24-28.

American Association of State Registration Executives. Kansas City, Mo. October 25-28.

American College of Surgeons. New York, N. Y. October 17-21.

American Dental Association. Hotel Statler, St. Louis, Mo. October 24-28.

American Dietetic Association — 21st Annual Meeting. Hotel Schroeder, Milwaukee, Wis. October 9-14.

American Public Health Association — 67th Annual Meeting. Hotels Muehlebach, President, Kansas City, Kansas City, Mo. October 25-28.

American Public Works Association. New York, N. Y. October 3-5.

American Society of Civil Engineers. Rochester, N. Y. October 12-14.

American Water Works Association: Minnesota Section. Minneapolis, Minn. September 29-October 1. Wisconsin Section. Milwaukee, Wis. October 10-12.

Missouri Valley Section. Hotel Fort Des Moines, Des Moines, Ia. October 13-15.

Southwest Section. Biltmore Hotel, Oklahoma City, Okla. October 17-20.

Association of Dairy, Food and Drug Officials of the United States. Palmer House, Chicago, Ill. October 19-21.

Association of Military Surgeons of the United States. Mayo Clinic, Rochester, Minn. October 13-15.

Association of Women in Public Health — 17th Annual Conference. Excelsior Springs, Mo., October 23-24; Kansas City, Mo., October 24.

Conference of State Laboratory Directors. Kansas City, Mo. October 24.

Conference of State Sanitary Engineers. Kansas City, Mo. October 24.

Florida Public Health Association. Hollywood, Fla. November 28-30.

International Association of Milk Sanitarians. Cleveland, Ohio. October 19-21.

International Society of Medical Health

Officers. Kansas City, Mo. October 24.

Medico-Military Inactive Duty Training Unit—under auspices of the Mayo Foundation. Mayo Clinic, Rochester, Minn. October 13-15.

Michigan Public Health Association. Lansing, Mich. November 9-11.

National Association of Housing Officials. Washington, D.C. Oct. 11-14.

National Association of Sanitarians. Phoenix, Ariz. December 10.

National Dairy Association. Columbus, Ohio. October 8-15.

National Public Housing Conference. Washington, D. C. January 20-21, 1939.

National Safety Council. Chicago, Ill. October 10-14.

New Jersey Health and Sanitary Association, Inc.—64th Annual Meeting. Berkeley-Carteret Hotel, Asbury Park, N. J. November 18-19.

New Mexico Public Health Association. Las Vegas, N. M. October 31, November 1-2.

Northern California Public Health Association. January, 1939.

Pacific Association of Railway Surgeons. Los Angeles, Calif. October 7-8.

Southern Branch, American Public Health Association—7th Annual Meeting; and Southern Medical Association. Oklahoma City, Okla. November 15-16.

Symposium on Mental Health. Auspices of the American Association for the Advancement of Science—Section on Medical Sciences. Richmond, Va. December 27-31.

Texas Public Health Association. San Antonio, Tex. November 7-9.

U. S. Public Health Service—Committee on Evaluation of Serodiagnostic Tests for Syphilis, Surgeon General Thomas Parran, Chairman. Assembly of Laboratory Directors and Serologists. Hotel Arlington, Hot Springs National Park, Ark. October 21-22.

FOREIGN

Conference on Rural Hygiene in American Countries. Mexico City, Mexico. November 10-20.

Pan-American Congress of Municipalities. Havana, Cuba. November 14-19.

Interested in Pasteurization?

If so, please let us send you new data, as issued, on apparatus and reagents for the

SCHARER PASTEURIZATION TEST

Made By

R. P. CARGILLE

Established 1924

118 Liberty Street New York, N. Y.

Greetings

to the

American Public Health Association

from



See our exhibit
at the

ANNUAL MEETING

Kansas City—October

FROSTED FOODS SALES
CORPORATION

250 Park Ave., New York City

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

November, 1938

Number 11

Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts*

C.-E. A. WINSLOW, DR.P.H., F.A.P.H.A.

Professor of Public Health, Yale School of Medicine, New Haven, Conn.; Chairman, Committee on the Hygiene of Housing of the American Public Health Association

THE American Public Health Association began its career with a clear recognition of the importance of housing as a public health problem. The very first volume of *Reports and Papers* of the Association for 1873 contains a report by Carl Pfeiffer, F.A.I.A. on "Sanitary Relations to Health Principles of Architecture." The second volume of *Reports and Papers* for 1874-1875 blossomed out with no less than 5 papers on housing problems, 2 by Dr. Ezra M. Hunt of New Jersey and one each by Dr. E. H. James of New York, Dr. Henry W. Dean of Rochester, and F. H. Hambleton, C.E., of Baltimore. Dr. Dean put his finger on the crux of the problem when he said: "I have not at present any special interest in the construction of dwellings for the affluent. Given the

sanitary principles in the substructure, the superstructure in its general appointments is commonly well provided for sunlight, and in the form and capacity of its living rooms. In the tenements and houses provided for the middle and laboring classes, the classes constituting three-fourths or more of our population, and the source of a still larger proportion of native born children, the State should see to it that such homes are made healthy, and preserved in such conditions as to conduce to the maintenance of health."

The third volume of *Reports and Papers* for 1875-1876 again contains 4 papers on housing problems, by Dr. Hunt, once more, and by such distinguished leaders of the Association as Dr. Stephen Smith, Col. George E. Waring, Jr., and Prof. E. N. Horsford. Dr. Smith showed that the proportion of the total mortality of New York City contributed by its tenement population was decreasing. He attributed this to

* Presented on behalf of the Committee on the Hygiene of Housing before the Health Officers Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

sanitary inspection of tenements and urged the extension of such service to other dwellings; and Professor Horsford calls for "a new profession, akin to that of engineering, or to that of engineering and medicine united." The expert he visualizes should be "the 'house physician,' 'the sanitarian'—the efficient and consulted brother of the 'family physician.'"

The specters of carbonic acid, crowd poison, sewer gas and ground air stalk across these yellowed pages; yet in many of the papers, notably those of Dr. Ezra Hunt, there is much that remains sound and significant after sixty-five years.

Later on, the early interest of our Association in physiological and hygienic problems, in broad environmental and social influences, faded in the brilliant light of the germ theory of disease. For half a century the struggle between microbe and host dominated the scene and only during the last few years have the potent factors of diathesis on the one hand and of social environment on the other come back into the picture.

Today, we again recognize that while it is difficult or impossible to obtain a quantitative evaluation of the exact relation between housing conditions and mortality rates there are numerous aspects of housing which, indubitably and in important degree, do influence human health in its physical, emotional and social aspects.¹ We may perhaps say, with Stephen Smith in 1876, "The great want of American communities today is sanitary architecture in our dwellings and sanitary supervision in their management."

As a result of developments during the past 5 years, this "great want" is at last in the way of being met; and it is these developments which make the problem of such urgent moment to the health officer.

The United States has been singularly

backward, as compared with the nations of Western Europe, in its solution of this problem. It has been estimated that nearly 6 million new dwellings would have been needed in 1937 to meet the quantitative housing shortage and to replace qualitatively the most unsuitable slum areas, and that provision for increasing population and replacement of obsolescent dwellings will call for over 10 million more dwellings by 1950. To catch up with minimum needs by that date will, therefore, call for more than a million new dwelling units a year.

In the years between 1932 and 1937, the federal government for the first time attacked the situation, chiefly—so far as actual construction was concerned—through the Housing Division of the Public Works Administration and the Resettlement Administration. The PWA, which was the agency dealing with urban housing, built 51 projects in 35 cities of 20 states, 2 territories, and the District of Columbia.

The government housing program was put on a permanent basis by the passage of the Wagner-Steagall Act of 1937. This act created the United States Housing Authority as a "body corporate of perpetual duration," "to provide financial assistance to the states and political subdivisions thereof for the elimination of unsafe and insanitary housing conditions, for the eradication of slums, for the provision of decent, safe and sanitary dwellings for families of low income, and for the reduction of unemployment and the stimulation of business activity." To carry out this program, Congress has authorized the Authority to lend 800 million dollars during its first 3 years. The Act requires the elimination by demolition, condemnation and effective closing, or the compulsory repair or improvement of an unsafe or insanitary dwelling unit in the locality for every new dwelling unit in a housing project. The elimina-

tion of slum dwellings may be deferred, in the discretion of the Administrator, where an acute housing shortage exists. All slum clearance and low-rent housing programs must be initiated by the localities themselves (not by the federal government as in the earlier PWA projects); and local initiative is taken by a duly constituted "public housing agency." This agency may be a municipality, county, or state (duly authorized under proper enabling state legislation), but will normally be a local housing authority which is a public corporation, without taxing power, created or authorized by state law for the purpose. Thirty-three states have now passed enabling acts creating "public housing agencies."

In addition to the provisions of the Wagner-Steagall Act and quite independent of it, is the program provided for in the National Housing Act of 1938 to stimulate private building operations for families on a higher economic level. Under this act the federal government will act as a mortgage guarantor for projects which conform to certain specified conditions, including minimum health standards. This program will be administered by the Federal Housing Administration which is a government agency entirely distinct from the United States Housing Authority.

It is the U. S. Housing Authority under the directorship of Nathan Straus which will be concerned with low-cost housing; and it is the program of this agency which is of most vital concern to the health officer.

In many European countries, the guidance of the national housing program lies in the hands of public health authorities. In England, for example, the comprehensive plans, finally crystallized in the Housing Acts of 1935 and 1936, are administered entirely by the Ministry of Health. The last report of the Ministry outlines the 3 objectives

of that Act as follows: (1) the clearance or other appropriate treatment, within a prescribed period, of unfit houses and the effective housing of those displaced; (2) the abatement of excessive overcrowding and the rehousing of the overcrowded families; (3) the assurance of an adequate regular production of good and cheap houses to meet ordinary working-class demands outside the slum and overcrowding sphere. The first of these objectives has been essentially attained and the second is now in process of realization, following a comprehensive survey of overcrowding completed 2 years ago. The Minister of Health reports that between 1918 and March, 1936, 1,259,387 houses have been completed under the successive Housing Acts with government contributions of 164,489,622 pounds.

In the development of the early stages of our American housing program—although no such primary health department responsibility has yet been recognized—both voluntary and official health agencies have played a substantial part. In Cincinnati, Cleveland, Philadelphia, Pittsburgh, and Washington, individuals or groups of public health workers have been active in promoting a study of housing needs and in stimulating remedial measures.

In Chicago, as in other cities, the Board of Health has control over heating, lighting, ventilation, plumbing, and drainage within buildings, and controls dwelling conditions from the time that plans for new and remodeled structures are submitted for approval, through the period of construction and during occupancy. Furthermore, in the report of Dr. Bundesen's Bureau of Sanitary Engineering—as far back as 1923–1925—we find constructive discussion of the general housing shortage and its cure as well as analysis of specific structural defects. In 1934 Dr. Bundesen was made Chairman of the Mayor's

Committee on Sub-Standard Housing, on which the Fire Department, and the Departments of Buildings, Loans and Public Works, as well as Public Health, were represented. During the next year and a half this committee brought about the demolition of several thousand sub-standard dwellings which were deemed a menace to public health and safety.

In Hartford, in 1934, the Mayor's Housing Commission was set up at the request of the Health Department. In Birmingham, the County health officer in the same year instigated an Advisory Council which made numerous surveys and was directly responsible for the creation of a local housing authority and the construction of a negro project.

In Memphis, the Health Department has been an outstanding leader in this field. Dr. L. M. Graves and A. H. Fletcher have presented 2 valuable papers before the Health Officers Section of the A.P.H.A.² reviewing the progress which has been made. These health administrators believe that "good housing is an essential foundation on which to build a well rounded health program." They add that, "in the larger cities where so much needs to be done, the health department may not actually be concerned with the administration of a housing program, although it will certainly be called on to investigate complaints in regard to poor housing conditions and will be in a position to make its influence felt in trying to work out a solution. In many cities the health department may be the logical agency to take the prime interest in, and to define to a large extent the housing problem and undertake its solution." Dr. Graves and Mr. Fletcher compiled a comprehensive housing study in 1934 and a second more intensive survey of slum areas in 1937; and, as a result, are in position to replace haphazard response to complaints in regard to insanitary condi-

tions by a constructive and basic health program.

In 1937, an intensive survey was made of all tenement buildings and dwelling houses in one ward of the city of Newark, by the Health Department of that city under the direction of Dr. C. V. Craster; this survey is thought to have aided materially in securing for the city an earmarking of 12½ million dollars for low-cost housing.

These instances of leadership by American health officers in the housing field by no means exhaust the record. They simply illustrate the fact that the day is past when housing was merely a problem for private speculative enterprise and when the health officer could limit his work to the negative task of eliminating the more obvious insanitary conditions, with little thought for the positive challenge of planning a program of adequate housing for the future.

During the past 5 years, when the initiative for new housing projects has come from Washington, the opportunity for active participation by the health officer could easily be ignored. Now, however, the whole picture has changed. Housing under the Wagner-Steagall Act is a local municipal enterprise. Destruction of slums and creation of good new housing are linked in a new type of municipal housekeeping enterprise, fundamentally dominated by health needs in their broad connotation.

This concept of civic housekeeping, and the housing movement which is a basic part of it, spring from a new philosophy which is emerging with respect to our cities of today and to the possibilities of urban living in the future. Workers in health and social reform are not alone in recognizing that slums and blighted areas present a menace to the stability of our whole urban structure.

The unplanned growth of cities; the flight of many people from deteriorating

urban areas to suburban regions where they seek to reestablish a decent environment: the resulting decline in central population densities, land values and tax revenues, and the diminishing usefulness of schools, parks, utilities and other public investments in such areas of shrinking population—these have aroused the serious concern of thoughtful mayors, assessing officials, city planners, and civic leaders of all sorts. There is an increasingly general acceptance of the proposition that great sections of our cities must, physically and literally, be rebuilt in order that those cities may enjoy a stable economy and a durable type of growth.

Progressive thinkers in city planning are turning away from their earlier preoccupation with the design of monumental civic centers, arterial streets and landscaped parkways, and from zoning practices suited to a boom psychology. From these superficial trappings of city growth they are turning to the central problem of human living, to the task of furnishing well planned and well located communities of dwellings. Thus only, can we provide a material matrix for a type of urban life which shall approximate the ideals of physical, mental, and social health. Thus only, can planning be developed on a basis which visualizes a relatively stable use of urban land and a reasonably permanent allocation of schools, parks, and other public services. City planners, in other words, are coming to recognize good housing as the only solid basis for urban development.

Under the guidance provided by this viewpoint, and with the immediate stimulus afforded by the new public housing legislation, great sections of our cities are going to be rebuilt, and within our own generation. In cities such as Cleveland, where over 9 million dollars has been spent and nearly 9 million more is earmarked, an impressive start has already been made. New

York City has built about 25 million dollars worth of U. S. projects and has 53 million dollars earmarked.

Although the immediate incentives of this new city planning and housing activity are many, the concept of health is central to all of its objectives. Those administrators and technicians who have responsible places in the housing program are increasingly anxious that the public health viewpoint shall be actively represented in the execution of that program. From intimate knowledge of the reception which has been accorded by housing groups to the first work of our Association's Committee on the Hygiene of Housing, I can say to you without qualification that the people who count in the housing field are waiting eagerly for the contribution which the public health profession can make. The cordial reception extended to our committee, on a national scale, by the National Association of Housing Officials, the American Federation of Housing Authorities, the American Institute of Architects, will be duplicated by local housing and planning officials as rapidly as local health officers and their departments demonstrate that they are ready and able to cooperate.

Just what is it that the health officer can contribute?

There are 5 stages of the housing program at which the influence of the health officer—with his basic knowledge both of local physical conditions and of local racial and social needs—should be of prime importance.

First of all, there is the problem of the housing which now exists, and the opportunity of improving and stabilizing it by the vigorous exercise of powers clearly vested in the health department. For it will be idle to build new housing if existing dwellings which can be improved are not improved, and if areas which could be saved from blight are allowed to deteriorate faster

than new housing can be built. On this level, housing enforcement programs such as those of the Chicago and Memphis departments warrant the closest study.

Activities of this sort are suggested in the *Appraisal Form** of the Association, which now includes the following questions with respect to health department activities:

a. Are data maintained by any city department concerning the total supply of dwelling accommodations including new construction, demolition, and vacancy?

Does any city department maintain a file of "sub-standard" (structurally unsafe) dwellings?

b. Are all plans for new dwellings or alterations on existing dwellings examined, and is approval mandatory, by the health department or some other city department, before building operations are commenced, in order to insure adequate space, light, ventilation, and sanitary equipment?

If approval of plans is by a department other than the health department, was the health department concerned in the establishment of standards for space, light, ventilation, sanitary equipment?

c. Does the health department have legal powers to demolish or control the occupancy of such "sub-standard" dwellings?

d. Does the department have power to inspect existing dwellings with regard to space, light, ventilation, and sanitary equipment?

Closely related to such improvement of existing sub-standard but improvable dwellings is the second problem—that of the slum elimination which must parallel or follow the development of any new housing project under federal grants. It is conceivable that such sanitary enforcement programs as have been outlined under my first category above would result in the elimination, by improvement, of sub-standard dwellings equal in number to those constructed by the local authority, and that credit for these eliminations could be granted. But it is the intent of the

Act, and it will generally be the fact, that the worst slums must be cleared by demolition. And the U. S. Housing Authority has ruled that this must be done not later than 2 years after a local housing shortage has been relieved by new construction.

Where the local authority elects to build new projects on slum sites, and where clearance of these sites provides the necessary slum elimination, the authority's powers of eminent domain will generally enable it to proceed without legal assistance from other city departments. But where the authority builds on vacant land, and must then select equivalent slum areas for later demolition, it will often be found that its rights of eminent domain do not apply, and the authority must depend on other city departments—health, building, police—for justification of the clearance. Even in the former case there should be agreement between the health department and the authority that the slums to be cleared are, in fact, those most suitable for clearance.

Who better than the health officer has the knowledge and the equipment to determine which are the "unsafe and insanitary" dwelling units to be eliminated? His inspectorate is the one existing agency which has or should have, the information necessary for determining the facts. It is the health officer who already possesses broad powers under the general laws governing control of nuisances, to be enforced by fines, by summary abatement, or by condemnation. In most urban communities, these powers are supplemented by specific statutory regulations governing building construction and occupancy. Finally, in certain jurisdictions it has been provided that a tenement may not be occupied until it has received a certificate from the board of health, bringing in the very convenient principle of licensing power. The knowledge now at the command of a

* *Appraisal Form for Local Health Work* (1st ed.), 1938, p. 156.

well organized health department should furnish the basis for housing demolition surveys and greatly simplify their execution.

A concern with the improvement of existing housing and with the condemnation and demolition of areas which are beyond improvement is obviously only the beginning of that interest which the health officer should display in this fundamental field of public health. It is of equal importance that he should play his part in the planning of the new public housing projects which are to replace the slums. It is to him that we should look for counsel in regard to those factors in the design of new dwelling units which influence health and which are determined by basic physiological and psychological needs, by the necessity for protection against contagion and accident. He and his staff know more about the racial groups of the city, their living habits, their psychological reactions, than any other municipal officers. Their counsel should be invaluable in locating new projects and in planning their design and arrangement. The availability of local clinics and other health facilities may often be a factor of fundamental importance. Some of the projects already constructed (as in New York City) include space for health department activities in their buildings; and this is a tendency which could be followed with advantage in the future.

Nor does the health officer's responsibility for these new housing projects cease when construction is completed. There are now about 50 such projects already in operation in our municipalities. They are, in general, adequately planned; but realization of the objectives of healthful housing depends on wise selection of tenants and on continuing supervision of occupancy. Under the new decentralized federal housing program, tenants must be chosen within specified income levels; but even

with such limitations there is real danger that the recommendations of local politicians may carry undue weight. In such contingencies, the presence of the health officer on the authority or on a board of review for tenant selection and regulation of occupancy should prove of inestimable value. We must remember that the health officer alone has the machinery to enforce regulations in regard to occupancy and sanitary maintenance on a continuing city-wide basis.

Finally, we should not permit our vision to be limited by the immediate problems of slum clearance and the provision of low-rent housing under the U. S. Housing Administration. These are parts of a more comprehensive plan for the best attainable housing facilities serving the entire community. An important factor in this problem is the Federal Housing Administration which as a mortgage guarantor is in position to stimulate the construction of the right type of housing on a commercial basis for persons in a middle income range. The health officer, if properly qualified, might play an important rôle in integrating public and private housing enterprises, and in coordinating the activities of architects, builders, and financiers with the real health needs of the people to be served. His professional training and his position of impartial objectiveness might be made a strong factor in holding both public and private housing to their underlying objectives, and encouraging private enterprise to play its part in the total program.

All this is a tremendous challenge to us as public health workers. The first step for the health officer who is ready to meet that challenge is, obviously, to become fully familiar with the state and local legislation in this field and with the administrative machinery which has been set up to make it operative. A second step should be to analyze the

data now in health department files and to determine what further surveys are necessary to make the actual local housing situation clear. WPA forces are being permitted to furnish assistance in this field which should prove invaluable; and recent reports prepared under the direction of R. H. Britten as a part of the National Health Survey of the U. S. Public Health Service will give the local health officers of cities included in that survey first-hand data as to housing conditions which will be of the most fundamental importance.

In developing such affiliations, the health officer will find a knowledge of the wider national movement of substantial advantage. This can be furthered materially by contact with the National Association of Housing Officials.* The publications of this association, particularly its pamphlets on *Demolition of Substandard Housing*, and *Planning for Low-Rent Housing*, will be found of interest to every health officer. The U. S. Public Health Service is in position to aid you in your tasks through the appointment of Dr. J. M. DallaValle as its officer specifically assigned to study the housing problem.

In particular, however, I am here today to offer you the assistance of your own A.P.H.A. Committee on the Hygiene of Housing. One of the chief purposes in establishing this committee was to aid the health officer in meeting this new demand upon his time and energy. We have prepared—primarily for your use—a report on the Basic Principles of Healthful Housing.³ This report has already been distributed by the National Association of Housing Officials, at the suggestion of Housing Administrator Straus, to local authorities as a guide in the planning of their projects. Together with a companion report of N.A.H.O., it has been tenta-

tively approved by the two chief housing agencies of the federal government for official publication. This committee of the A.P.H.A. has therefore already made some contribution to the cause on your collective behalf. We trust that it may help you individually to orient your services to the cause in your respective areas; and, within limits of time and money, the membership and staff of the committee are at your disposal for contact with existing literature in this field and for counsel as to particular local problems. We believe that full and active participation in the local housing program will enable you as health officers to render a contribution toward the promotion of public health which is logically yours and which will open up one of the most vital and most promising areas of public health service for the coming years.

In its medical aspects the public health program began as a repressive police activity concerned almost wholly with isolation and quarantine. Today it has taken on a positive constructive aspect, and in its clinics, its nursing, and its educational work it is primarily concerned with direct service to the individual citizen. In the field of sanitation (except for the provision of public water supplies and sewerage systems) the emphasis is still largely on police control. The housing program offers to the sanitarian a unique opportunity to pass over into the service field and to gain the support which comes from appreciation of contributions rendered directly to the people whom he serves.

REFERENCES

1. Britten, R. H. *Pub. Health Rep.*, 49:1301 (Nov. 2), 1934; and Winslow, C.-E. A. *A.J.P.H.*, 27:56 (Jan.), 1937.
2. Graves, L. M., and Fletcher, Alfred H. *Housing Problems in a Southern City. A.J.P.H.*, 25, 1:31 (Jan.), 1935.
3. Graves, L. M., and Fletcher, Alfred H. *Developing a Housing Program in a Southern City. Ibid.*, 27, 7:645 (July), 1937.
3. *A.J.P.H.*, 28, 3:351-372 (Mar.), 1938.

* 1313 East 60th St., Chicago, Ill.

Administrative Control of Food Handlers and Places Dispensing Food and Drinks

KATHERINE MARDEN, F.A.P.H.A., JOSEPH M. CURRY,
D.V.S., LOUIS J. HOROWITZ, AND BENJAMIN G.
HORNING, M.D., F.A.P.H.A.

*Director, Bureau of Laboratories; Director, Bureau of Food and
Sanitation; Chief Food and Milk Inspector; and Health
Officer, Board of Health, Hartford, Conn.*

THE administrative control of food handlers and places dispensing food and drinks is one of the most difficult problems in the field of public health. The subject has been receiving much attention from public health officials during the past few years, and considerable data concerning the problem have appeared in the literature. The purpose of this article is to review the subject briefly and to describe recent activities of the Hartford Board of Health in this field.

Food handlers play a rôle of some importance in maintaining the health of the community. This group includes housewives and servants in private homes, as well as food handlers in public and semi-public places. The housewife may not be the cause of an extensive outbreak of disease, but she may cause illness among her own family and guests by failure to observe proper precautions in storing, preparing, and serving food. It is the responsibility of health officials to instruct food handlers concerning the danger of food-borne diseases and their prevention. It is also important that consumers know what is expected of food handlers in the way of personal hygiene and other preventive measures.

The germs of many communicable diseases may be present in the human nose, mouth, throat, genitourinary and gastrointestinal tracts, and leave the body with excretions from these parts. In this way diseases may be spread by case or carrier, either directly or indirectly. If the illness is spread by one with symptoms, it is usually easy to find the source of infection. If spread by carrier, it is more difficult. It is well known that the following diseases, as well as others, may be spread by contaminated food:

Amebiasis	Poliomyelitis
Diphtheria	Scarlet fever
Dysentery, bacillary	Streptococcus sore throat
Food poisoning	Tuberculosis
Paratyphoid fever	Typhoid fever

These and many other diseases, including those listed below, may also be spread indirectly by contamination of dishes and other utensils, or directly from food handlers to customers:

Chickenpox	Pneumonia, broncho
Conjunctivitis, infectious	Pneumonia, lobar
Encephalitis, epidemic	Smallpox
Influenza	Syphilis (rarely)
Measles	Common cold
Meningococcus meningitis	Vincent's angina
Mumps	Whooping cough

Personal cleanliness is one of the

fundamental principles of food handling. Proper washing of the hands after using the toilet, after contamination from coughing or sneezing, and before beginning to prepare or serve food is of the utmost importance. The hands may become contaminated with discharges from the nose, mouth, throat, genitourinary and gastrointestinal tracts, and may be a menace to the public. If the hands are to be washed thoroughly, hot running water, soap, nail brush, and ample time are necessary. They should be dried on individual towels. The finger nails should be neatly trimmed and free from dirt at all times.

It has been shown that the routine examination of food handlers by supervisory authorities has had but little effect upon the incidence of disease. Compulsory laws, involving a large expenditure of money and frequently giving a false sense of security, would not seem to be justified. A number of cities which formerly issued health certificates to food handlers have discontinued doing so. From the standpoint of public health administration, experience indicates that the spread of such diseases as typhoid fever, syphilis, and tuberculosis can be controlled more satisfactorily and economically by investigating all cases and contacts in the community and bringing the sources of infection under control, than by routine examination of food handlers. However, a periodic health examination by a physician is highly desirable for the individual, and the Hartford Board of Health advises that it be done on a voluntary basis.

Many foods at room temperature serve as excellent media for the growth of certain disease producing germs. Great care must be taken in the preparation, storage, and dispensing of such foods. Before serving they should be heated to such a degree as will kill pathogenic bacteria. Food that is not intended for immediate consumption

should be placed under refrigeration. Many cases of illness result each year from the improper preparation and storage of cream filled pastry, meats, and other foods.

All foods should be given individual service. Serving forks, tongs, spoons, and other implements should be used to handle such foods as cake, candy, bread, and lump sugar. Persons preparing salads, sandwiches, and foods to be eaten unheated, should take the maximum precautions to prevent touching the ingredients with their hands.

Glasses, dishes, silverware, and other utensils in which food is prepared, stored, or served should be cleansed, disinfected and properly protected from contamination until used again. This protects the next person from germs which may have been left by the food handler, or by the customer who previously used the utensil.

LABORATORY STUDIES AND LEGISLATION

A laboratory study of drinking glasses from places dispensing food and drinks in Hartford was begun in the autumn of 1934 and continued through the summer of 1935.¹ The purpose of the project was to determine the efficiency of disinfection of glasses, dishes, and other eating utensils. One glass was examined from each of 200 drug stores, 232 taverns, and 198 restaurants—or a total of 630. The tavern glasses were examined during the winter and spring, and those from the restaurants and soda fountains during the autumn of 1934 and summer of 1935.

At the time the study was begun a review of the literature² revealed no accepted standard laboratory methods for such work, hence the results may not be comparable with similar studies elsewhere. It was necessary to develop a technic which would be relatively simple, and yet would give a representative bacteriological picture of conditions. At first only total plate counts were made

from supposedly clean glasses. As the study progressed, it was decided to determine the type of organism on the glass rim, and the bacteriological content of the entire glass.

The cultures were made in the establishments by a representative of the Board of Health. A definite amount of sterile water and a swab were provided for each glass. The water was placed in the glass and worked around in such a way as to wash down the bacteria, and then returned to the original bottle. The swab was rubbed around the rim of a second glass, approximately 1 inch from the top inside and outside, and returned to its tube. They were then brought to the laboratory and cultures were made within 1 hour. Agar plates were made from the glass washings and incubated for 36 hours. The swab was placed in a tube of sterile bouillon and allowed to incubate over night. It was found that this period of incubation was the most satisfactory for preventing over-growth by spore formers. In the morning the swab was removed from the tube, direct smears were made, and it was then discarded. The smears were stained by the Gram method. Blood agar and Endo plates were made from the broth tubes. After 24 hours' incubation these plates were examined macroscopically for hemolytic or coliform colonies.

A second bacteriological survey of glasses was begun in the autumn of 1935 and continued through the summer of 1936. In this study the rim of one glass from each of 690 estab-

lishments was cultured. By this time a routine laboratory technic had been developed. The laboratory technician taking the cultures was provided with 10 c.c. of sterile water in a test tube and a sterile dry swab wrapped in paper. Just before taking the culture, the swab was moistened in the water and rubbed on the rim of the glass, inside and out. The swab was returned to the tube of sterile water and brought to the laboratory. Before making the culture, the swab was shaken vigorously in the sterile water. This was continued until the cotton was nearly loosened from the swab. A measured portion of the water was used for a plate count, and a broth culture was made from the swab. A smear was made from the broth culture, stained by the Gram method, and examined for type of organism. Colonies on the agar plates were counted and the count was adjusted after figuring the dilution. A summary and comparison of the bacteriological findings of the two surveys will be found in Tables I, II, and III.

The results of the laboratory studies indicated that many places in Hartford were not adequately disinfecting eating utensils. A large percentage of glasses examined were found to be contaminated with bacteria commonly found in the human upper respiratory and gastrointestinal tracts. It was shown that rinse water of 130°F., as required by Board of Health regulation, would not properly disinfect eating utensils.

A careful survey of disinfecting agents and methods was made. It was con-

TABLE I
Plate Counts from 630 Drinking Glasses, 1934-1935

<i>Colonies</i>	<i>Restaurants</i>	<i>Drug Stores</i>	<i>Taverns</i>	<i>Total</i>
0- 100	47	24	17	88
100- 1,000	41	42	24	107
1,000-100,000	86	103	146	335
Over 100,000	24	31	45	100
Total	198	200	232	630

TABLE II
Bacteria Cultures from 630 Glass Rims, 1934-1935

Organism	Restaurants Positive		Drug Stores Positive		Taverns Positive	
	Number	Per cent	Number	Per cent	Number	Per cent
Streptococci	12	6.1	8	4.0	77 *	33.2
Staphylococci	40	20.2	56	28.0	73 †	31.5
Pneumococci	3	1.5	0	0.0	23	9.9
Coliform	15	7.6	57	28.5	87	37.5

* Hemolytic streptococcus 3

† Hemolytic staphylococcus aureus 6

TABLE III
Bacteria Cultures from Glass Rims

Organism	630 Examinations 1934-1935 Positive		630 Examinations 1935-1936 Positive	
	Number	Per cent	Number	Per cent
Streptococci	97	15.4	99	14.3
Staphylococci	169	26.8	148	21.4
Coliform	159	25.2	127	18.4

cluded that from the administrative point disinfection by hot water would be the simplest to supervise. The efficiency of certain chemical agents in disinfection was granted, but their supervision would not be practical in Hartford. Bacteriological studies were made to determine the minimum temperature and time needed for adequate disinfection. The new regulation was adopted on August 19, 1936, and became effective October 1, 1936.

Regulations Concerning the Cleansing of Glasses, Dishes, Silverware, and Other Utensils Used at Places Dispensing Food and Drink

a. All glasses, dishes, silverware, and other utensils used at places dispensing food or drink shall be washed after each service until clean to the sight and touch in warm water (110°-120° F.), containing soap or alkali cleanser.

b. After cleansing, all glasses, dishes, silverware, and other utensils, shall be placed in wire cages and subjected by immersion for at least 5 minutes to the bactericidal action of water heated to a minimum of 170° F.

c. Upon removal from the hot water, glasses, dishes, silverware, and other utensils shall be

stored in such a manner as not to become contaminated before being used.

d. Other equally effective methods of bactericidal action by heat, hot water, or steam will be approved.

e. When paper receptacles, ice cream cones, or other single service utensils are used for serving food or drink, they must be kept in a sanitary manner, protected from dust, flies, and other contamination.

A new regulation concerning the serving of food and drinks was also passed and an Inspection and Score Card System adopted.

Regulation Concerning the Serving of Food and Drink

a. Places manufacturing, preparing, and serving food and drink shall require all food handlers to wash their hands thoroughly with soap and water after using the toilet.

b. Places serving food and drink shall take the maximum precautions to prevent contamination of food and drink by hands of waiters and customers.

c. All food and drink shall be given individual service.

d. Places dispensing food and drink shall display the license and score card in such place as is plainly visible to the public, and is approved by the Board of Health.

TABLE IV
Bacteriological Examination of Glasses

<i>Organism</i>	<i>1934-1935</i>	<i>1935-1936</i>	<i>1937-1938</i>
	<i>614</i>	<i>690</i>	<i>2,794</i>
	<i>Examinations</i>	<i>Examinations</i>	<i>Examinations</i>
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
	<i>Positive</i>	<i>Positive</i>	<i>Positive</i>
Streptococci	15.3	14.3	0.3
Staphylococci	26.0	21.4	9.73
Coliform	25.3	18.4	4.76
No growth or spore formers	33.4	45.0	85.01

After sufficient time had been allowed for installation of equipment, and for instruction of proprietors and food handlers as to the necessity of adequate disinfection of utensils and observance of personal hygiene, a third survey was made. This included a plate count from the rim of glasses and a culture for the type of organism from all places dispensing food and drinks in the city. No attempt was made to classify streptococci or staphylococci as to hemolysis, and the Gram-negative bacilli were all classified as coliform organisms. The results are compared in Table IV with the studies made previous to the enforcement of the new regulations.

TABLE V
Bacteriological Examination of Glasses

<i>Colonies</i>	<i>1934-1935</i>	<i>1937-1938</i>
	<i>542</i>	<i>934</i>
	<i>Examinations</i>	<i>Examinations</i>
	<i>Per cent</i>	<i>Per cent</i>
	<i>Positive</i>	<i>Positive</i>
0	10.32	30.94
1- 100	5.53	21.73
100- 500	9.42	8.99
500- 1,000	8.51	5.36
1,000- 5,000	22.14	9.85
5,000-10,000	9.77	4.07
10,000-50,000	20.29	4.39
Over 50,000	14.02	14.67
Total	100.00	100.00

DISINFECTING EQUIPMENT

Less than 10 per cent of places dispensing food and drinks in Hartford had equipment and plumbing which ful-

filled the requirements of the new regulations. Two difficulties presented themselves. Manufacturers did not make the type of equipment suitable for the smaller places, and the plumbing in many establishments, even with new equipment, was not capable of maintaining water at the desired temperature. Representatives of equipment companies, sanitary engineers, and plumbers conferred with representatives of the Board of Health. Apparatus was designed, and laboratory studies were made to determine whether it would disinfect eating utensils.

The Board of Health licenses 623 places to dispense food and drinks in Hartford. All have installed approved disinfecting equipment. The types of apparatus may be divided into 5 groups: (a) tanks with dish trays; (b) sinks with dish trays; (c) hot air disinfectors; (d) mechanical dish washers; (e) paper utensils. Most of the smaller places have installed the simple tank type. Many fountains have sinks with trays. The heat for the first two types is generated by gas, and the temperature regulated either by thermostat or thermometer. The hot air disinfecter was designed by a local company. Laboratory tests have shown that utensils are disinfected by this type of apparatus when exposed to 250°F. for 15 minutes. The larger establishments have mechanical dish washing. Table VI summarizes certain data concerning disinfecting equipment in use in Hartford.

TABLE VI
Data Pertaining to Disinfection

Type Equipment	Number Places	Disinfecting Space Average Cubic Inches		Heated by	
		Per Place	Per Customer	Gas *	Electricity
Tank with Trays	308	4,400	22.5	299	9
Sink with Trays	169	4,762	25.2	156	13
Hot Air	47	4,852	19.3	16	31
Mechanical	62	5,070	8.7	59	3
Paper Utensils	37	0	0	0	0
Totals and averages	623	4,771	18.9	530	56

* Includes 15 disinfectors heated with coal and 5 heated with oil.

INSPECTION AND EDUCATION

The Inspection and Score Card is a valuable aid to the Board of Health Educational Program. It was patterned from Figure 64 of *Recording of Local Health Work*, by Walker and Randolph.³ Their form was simplified and adapted to our local needs. It is required to be posted where it will be visible, and may be inspected by customers. A leather holder is provided by the Board of Health, and a duplicate Score Card is filed in the Board of Health office. The establishment is scored monthly. This does not mean that it is inspected only once each month as frequently it may be necessary to make several visits. Four points are allowed for each item. When practical, the place is scored by a different inspector each month.

The representative of the Board of Health makes the inspection in the presence of the manager and other employees. It is an educational visit. Each item is inspected carefully and criticisms and suggestions are made. If violations are found, a note is made on the back of the Score Card and a reasonable length of time is given for necessary corrections. The Score Card is proving a stimulus to establishments to improve the standard of their service. It gives the Board of Health an opportunity to educate food handlers in

the best methods of food handling and personal hygiene. The Score Card is also very helpful to the inspector. It provides him with a standard inspection procedure and a monthly record of each establishment for comparison.

DISCUSSION

It is impossible to estimate the amount of disease spread by food handlers and eating utensils. Lynch and Cumming⁴ made extensive studies of dish washing in several army stations. These investigators found that the influenza rate was much higher among men using dishes washed in the line, than among those who ate at the tables and whose dishes were washed in water of higher temperature. "In an epidemiological study of 66,076 troops it was shown that there was an influenza rate of 51.1 per 1,000 troops among those who had the advantage of collective washing of utensils, while among those who washed their own mess gear in warm water, the rate was 252 per 1,000."⁵ They concluded⁴ that if mess kit dish water is responsible for explosive outbreaks in the army, perhaps, common dish water in public eating places likewise is responsible for the spread of certain diseases.

Cumming⁶ sent questionnaires to public institutions in the United States. The 370 institutions replying formed

MONTHLY SCORE SHEET FOR PLACES DISPENSING FOOD AND DRINK IN HARTFORD
(PROPERTY OF THE HARTFORD BOARD OF HEALTH)

Firm Name		Address											
Owner or Proprietor		Nature of Business											
Date		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Buildings	Arrangement	...	...	...	...	...	...	...	...	...	...	...	...
	Floor	...	...	...	...	...	...	...	...	...	...	...	...
	Walls and ceilings	...	...	...	...	...	...	...	...	...	...	...	...
	Light and ventilation	...	...	...	...	...	...	...	...	...	...	...	...
	Screening	...	...	...	...	...	...	...	...	...	...	...	...
	Toilets	...	...	...	...	...	...	...	...	...	...	...	...
	Handwashing facilities	...	...	...	...	...	...	...	...	...	...	...	...
Utensils	Kitchen	...	...	...	...	...	...	...	...	...	...	...	...
	Dishes	...	...	...	...	...	...	...	...	...	...	...	...
	Silverware	...	...	...	...	...	...	...	...	...	...	...	...
	Mechanical equipment	...	...	...	...	...	...	...	...	...	...	...	...
	Dishwashing equipment *	...	...	...	...	...	...	...	...	...	...	...	...
	Sink and drainboard	...	...	...	...	...	...	...	...	...	...	...	...
	Tables and counters	...	...	...	...	...	...	...	...	...	...	...	...
Refrigeration	Ice box	...	...	...	...	...	...	...	...	...	...	...	...
	Water cooler	...	...	...	...	...	...	...	...	...	...	...	...
Food storage	Meat	...	...	...	...	...	...	...	...	...	...	...	...
	Milk	...	...	...	...	...	...	...	...	...	...	...	...
	Other supplies	...	...	...	...	...	...	...	...	...	...	...	...
Food service		...	...	...	...	...	...	...	...	...	...	...	...
Waste and garbage receptacles		...	...	...	...	...	...	...	...	...	...	...	...
Flies and vermin		...	...	...	...	...	...	...	...	...	...	...	...
Employees	Health certificates	...	...	...	...	...	...	...	...	...	...	...	...
	Washable outer garments	...	...	...	...	...	...	...	...	...	...	...	...
	General cleanliness	...	...	...	...	...	...	...	...	...	...	...	...
Total score		...	...	...	...	...	...	...	...	...	...	...	...
Employees	Male, number	...	...	...	...	...	...	...	...	...	...	...	...
	Female, number	...	...	...	...	...	...	...	...	...	...	...	...
Inspector's initials		...	...	...	...	...	...	...	...	...	...	...	...

* To maintain temperature of water at minimum of 170° F. Score based on rating of 4 points per item.

the basis for the report. These came from every state in the Union and from many different types of institutions. As a result he concluded that the major avenue of infection was through interchange of contaminated eating utensils. He found that the pneumonia mortality rate was higher in institutions than in the army or civil life, due perhaps to larger messing groups and lack of sanitary dish washing.

Cumming and Yongue⁷ stated that there were sound reasons for believing the sanitation of eating and drinking utensils is an important factor in disease control. They found that only 60 per cent of the contamination was removed by the washing process, but when the

hand or machine method was consistently carried out, there was 99 per cent reduction in bacteria.

In 1924 the city of Dayton, Ohio, began a study⁸ designed "to give greater protection to the eating out public." The investigators through a program of inspection, instruction, and laboratory examination have worked out a system of ratings which are published monthly in the bulletin of the Health Department.

That this method has been effective is shown by the fact that in 1925 only 28 per cent of the restaurants received the Class A or excellent rating, whereas 92.5 per cent received the Class A rating in 1933.

Laboratory studies (Tables I, II, and III) have shown that a high percentage of drinking glasses used in places dispensing food and drinks in Hartford were contaminated with bacteria from the upper respiratory and gastrointestinal tracts. The same condition was undoubtedly true of other eating utensils. A study made after the installation of disinfecting apparatus (Table IV) demonstrated a marked improvement in the bacteriological findings. The percentage of glasses adequately disinfected increased from 33.4 per cent and 45.9 per cent in the first two studies to 85 per cent in the last survey. This was too great a difference to be due to chance, and it seems fair to conclude that it was due to the program which included new legislation, the installation of disinfecting equipment, and mass education.

The Board of Health program to improve the sanitary condition of places dispensing food and drinks in Hartford has been received with enthusiasm by the public. The proprietors and employees of establishments have been coöperative. The policy has been one of education rather than police force. Food handlers are being instructed in the correct principles of personal hygiene and the best methods of preparation, storing, and dispensing of foods. The public is being taught to demand modern and approved methods of food sanitation. This is being accomplished through the press, radio, lectures, literature, demonstrations, and personal contact by trained personnel. The problem is a difficult one, and only a beginning has been made. Years of conscientious effort will be required to accomplish the maximum results.

CONCLUSIONS

1. Laboratory examinations have shown that a large percentage of drinking glasses used at places dispensing food and drinks in Hartford were not adequately disinfected. They were frequently found to be contaminated with bacteria from the human upper respiratory and gastrointestinal tracts.
2. Only a small percentage of places dispensing food and drinks in the city had equipment and plumbing capable of disinfecting eating utensils as required by the new Board of Health regulations.
3. Laboratory examination of glasses following the installation of apparatus capable of disinfecting eating utensils showed a marked improvement in dish washing sanitation.
4. The Inspection and Score Card adopted by the Board of Health has proved to be a valuable administrative aid as well as a stimulus to the proprietors of eating establishments to raise the standard of their service.
5. Legislation, and disinfection of equipment are of little value unless followed by an educational program for the instruction of both food handlers and the public in the correct principles of food handling.

REFERENCES

1. Botsford, C. P., M.D., Health Officer Emeritus, Hartford, Conn. Unpublished Data, 1934-1935.
2. The Public Health Committee of the Cup and Container Institute, 30 Rockefeller Plaza, New York, N. Y. *Techniques for the Bacteriological Examination of Glasses*.
3. Walker and Randolph, *Recording of Local Health Work*, pp. 216, Figure 64.
4. Lynch, Charles, M.D., and Cumming, James G., M.D., Dr.P.H. The Distribution of Influenza by Indirect Contact—Hands and Eating Utensils. *A.J.P.H.*, 9, 1:25-38, 1919.
5. Cumming, James G., M.D., Dr.P.H., and Yongue, N. E. Eating Utensil Sanitation. *A.J.P.H.*, 26, 3:237-244 (Mar.), 1936.
6. Cumming, James G., M.D., Dr.P.H. Influenza-Pneumonia as Influenced by Dish Washing in Three Hundred and Seventy Institutions. *A.J.P.H.*, 9, 11:849 (Nov.), 1919; 10, 7:556 (July), 1920.
7. Cumming, James G., M.D., Dr.P.H., and Yongue, N. E. A Standard Technique for the Bacteriological Examination of Eating Utensils. *Mil. Surgeon*, 80, 6:411-417 (June), 1937.
8. Our Method of Protecting Health Through Cleanliness Rating of Eating and Drinking Utensils. *Bull. Div. of Health*, Dayton, Ohio, Mar. 1, 1936.
9. *Memorandum on the Cleansing and Bactericidal Treatment of Glasses, Dishes, etc.*, U. S. Public Health Service—Office of Milk Investigations.

Projection of Public Health Engineering in New York State*

W. H. LARKIN, C.E.

*Supervising District Engineer, State Department of Health,
Middletown, N. Y.*

THE New York State Public Health Law, which is the legal basis for all public health work in the state, provides for the State Department of Health under direction of a commissioner, local boards of health for all political subdivisions, including cities, villages, towns and special consolidated districts, and medical health officers to serve each local health district. The Public Health Law has been amended from time to time but the general setup for health work has not changed since 1893.

The Public Health Council was established by the laws of 1913, with legislative authority to enact rules and regulations known as the State Sanitary Code. Naturally, the Sanitary Code is more flexible than the Public Health Law and is often added to or amended. Thus the local health officers are charged with enforcement of the Sanitary Code, and specific duties, including matters pertaining to environmental control of sanitation, have been materially increased in recent years by such amendments.

DEVELOPMENT OF THE DIVISION The New York State Department of

Health is relatively old. The Division of Sanitation was created in 1906, therefore its engineering work may be classed with that of a few other states as being among the pioneer public health engineering projects of the country. On July 1, 1921, the "Division of Sanitary Engineering," with 13 engineers, was abolished and the "Division of Sanitation" created. The reorganized division had only 5 men, a director, and 4 assistant sanitarians.

The reduction of the engineering force in 1921 resulted, as I understand it, from an effort to consolidate all engineering work of the various state departments in the office of the state engineer. This might seem like a logical move to the average layman, but the value and practical necessity of the engineer in a well organized public health department is demonstrated by the growth of the Division of Sanitation in the New York State Department since 1921 to one of the most important divisions in the department. The division now includes 41 engineers and 30 milk sanitarians. The milk sanitarians are technically trained men with degrees other than engineering. Many of the present positions are made possible by funds of the Social Security Act.

While there have been some new and different activities undertaken in recent

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 26, 1938.

years, the older reports indicate active work along the major branches of the environmental program as carried on today. The most notable development in New York State has been in the increase of personnel which has provided for a more effective control over these fundamental environmental factors.

The work in the sanitary control of milk was given additional emphasis, beginning in 1928, with the revision of Chapter III of the State Sanitary Code, requiring the approval by the state department of all pasteurizing plants. Then, in 1930, the Bureau of Milk Sanitation was created within the Division of Sanitation, this being the first bureau formed. The creation of the Bureaus of Camp Sanitation, Water Supply, and Sewage and Waste Disposal followed in 1935, 1936, and 1937. Each has provided for the concentration of effort and responsibility of the assigned personnel on these respective activities which had become a practical necessity.

ESTABLISHMENT OF DISTRICTS

With the entire personnel of the Division of Sanitation located in Albany and travelling out over the state from that point, it was difficult to exercise detailed supervision of water supply or sewage treatment plants at distant points. In addition, it was necessary for the engineer going into a community to have a thorough knowledge of the system and its history before the best assistance could be given. With different engineers going into the community, it took a great deal of additional work each time to acquire this knowledge of local conditions. The long distances, besides being costly, resulted in a rather high percentage of time spent in travel and a relatively lower percentage in productive field work. These considerations led to the assignment of an engineer to the first district in December, 1930, and, follow-

ing the successful results of the work in the pioneer or experimental districts, engineers have been assigned to cover the entire state from district offices.

The state had been divided into districts since 1914 but the personnel of the districts did not include engineers, and the activities of the districts were decidedly limited. The number of these districts has recently been increased to 19 and a more complete decentralization put into operation. Each district covers two or three counties, is under the supervision of a district state health officer, and is equipped with professional and clerical personnel of all classes necessary for the operation of an independent unit. One or more engineers are stationed in each district, and 3 senior district engineers visit the other districts in a supervisory capacity. The principle of operation of the engineering work is that the policies are established and certain supervisory and consulting services furnished by the central office, but all routine and detail work is done by the district personnel.

WATER SUPPLIES

The sanitary supervision of public water supplies was the major activity in the early days of the Division of Sanitation and today is still one of the main functions of the district engineer. The Public Health Law places the responsibility for supervision of public water supplies directly upon the State Commissioner of Health and authorizes him to order necessary improvements. The supervision is of course exercised through the engineers. Because of these provisions, the State Department has always dealt directly with the local water supply officials, with the local health officer having only a minor rôle in connection with the public water supply. Supervision by the district engineers includes periodic inspections of systems and treatment plants, review and acknowledgment of reports upon

the operation of treatments, and the promotion of desirable improvements in equipment or operations. Recently routine laboratory examinations of samples from all public systems by the Division of Laboratories and Research of the State Department have been made. The district engineers are responsible for maintaining this program and transmitting the laboratory findings.

The intimate acquaintance with the various systems within the district and with the operating personnel enables the district engineer to maintain a closer and more effective supervision over them. Many improvements in public water supplies can be credited directly to the closer relationship and concentrated effort of the district engineer. We have experienced severe floods, damaging water supply plants, in which emergencies the district engineers have proved their value and the advantage of decentralized location and operation.

SEWAGE DISPOSAL

The Public Health Law in general prohibits the discharge of sewage into the waters of the state without a permit from the State Commissioner of Health. The State Department has enforced these requirements in cases of municipalities, industrial plants, institutions and public places, and plans for satisfactory treatment plants upon which the permits may be based, are required to be submitted. These plans are checked in detail by the Bureau of Sewage and Waste Disposal and all necessary field investigations are made by the district personnel. It is now possible, through the district personnel, to get all necessary field information before passing upon the plans. The department engineers coöperate with the consulting engineers in determining the degree or type of treatment necessary or desirable and in some cases a preliminary checking of the plans is done

in the district office. The district engineers are also proving their value in promoting new sewerage systems and treatment plants and often are primarily responsible for the formation of new sewer districts.

Largely as the result of federal aid, a great number of sewage treatment plants have been constructed in the past few years. The supervision over the operation of these, including the review and acknowledgment of operation reports, is through the district offices. There is no doubt that, with the closer connection of the district engineers, this supervision is better than before and the operation of the plants as a whole more effective.

MILK CONTROL

The local health officers are made responsible by the State Sanitary Code for the milk control program, since they alone can issue permits for the sale of milk, cream, and certain milk products, and are required by the code to see to the enforcement of all regulations governing production and processing. Approval of the State Department of pasteurizing plants and "Special A Raw" dairies and bottling plants must be secured by the health officer before issuing permits for pasteurized or "Special A Raw" milk or cream. The standards for "Special A Raw" milk are in many respects equal to certified milk. By a special law enacted in 1937, all milk and cream produced outside New York State for sale within the state must be under inspection of the New York State Department of Health. About one-half the personnel of the Bureau of Milk Sanitation is engaged in this out-of-state work.

The general supervision of milk sanitation as carried on by the State Department has been turned over to district engineers and district milk sanitarians. A considerable portion of the non-engineering technical personnel of

the milk bureau is doing laboratory or research and consulting work.

A much closer supervision has been maintained over pasteurizing plants since the decentralization of the work and a great deal of help and advice is given the local health officers concerning their duties. While some local health officers have been doing a fine job of milk control work, the majority of the part-time health officers are inadequately trained and insufficiently interested to do a good job. A great deal of effort is sometimes necessary to have the health officer secure the required information on the physical condition of the cows, condition of the dairies, bacterial quality of the milk, etc., before he issues or renews permits. In some cases we know definitely that complete information is not secured. A few health officers insist on having all inspections made by their own personnel and do not accept the reports of other health officers, which they are allowed to do by code provisions. If all the inspection work of the local health departments could be properly allocated, there might be a pretty good coverage, but as it now is, this inspection work is spread too thin in some places, while in others there is none. The majority of part-time local health officers dislike routine milk work and their definite obligation in connection with it, and welcome all the assistance they can get from the State Department personnel.

The State Department program includes the routine phosphatase testing of all pasteurized milk and cream. The samples are collected by or under the supervision of the district men and the work done by the laboratories of the milk bureau. Recent results of these tests have generally demonstrated effective pasteurization. In cases where the phosphatase tests indicate ineffective pasteurization, an immediate check is made of the pas-

teurizing plant and of the general operation. Usually the reason for the unsatisfactory result is discovered and immediately corrected. In case the difficulty cannot be found in the plant and corrected, and particularly if it seems probable there has been a deliberate short holding or mixing of milk, the sale of milk from this plant is immediately discontinued. Often arrangements are made for the temporary pasteurization of such milk in another plant. The operation of the questionable plant is resumed only when assurance is given that conditions will be satisfactory.

Supervision over the production and processing of milk is one of the major activities of the engineering program today and has proved its value in the increased percentage of pasteurized milk consumed and the elimination of outbreaks of illness traceable to allegedly pasteurized milk.

SUMMER RESORTS

The proper control over summer camps, hotels, etc., is a peculiarly difficult job for health officials. Usually their season lasts for only 8 to 10 weeks and the management is loath to spend the necessary money for proper facilities. Besides this, they cannot conveniently carry on major construction work during the operating season and yet they find it inconvenient to do it at other times.

In New York State we have approximately 3,000 camps listed and have a general knowledge of thousands of hotels, boarding and rooming houses. In one county, which is a popular resort for New Yorkers, it is estimated there are 2,400 places, with a capacity for caring for 500,000 people at one time.

Chapter VII of the Sanitary Code requires a permit from the local health officer and sets forth satisfactory rules and regulations for the operation of camps. An intensive campaign for the

improvement of camps has been carried on through the district offices since the formation of the Camp Bureau and much progress has been made. Considerable pressure has been put on the local health officers to get the camps under permit; assistance has been given the health officer in making surveys of large numbers of camps and reporting upon their condition. In some cases legal advice and encouragement have been given in the conduct of proper hearings for revocation of permits and the closing of camps where serious health hazards existed.

We have no satisfactory regulations governing the operation of resort hotels, rooming or boarding houses, and this class of place presents a real problem. Many of the operators are of such character that appeal to their pride is entirely ineffective and the only possible means of securing necessary improvements, such as safe water supplies and satisfactory sewage disposal systems, is by bringing legal pressure. Correction of unsatisfactory conditions has been secured in many instances as the result of the district engineer's recommending that the local board of health take the necessary action and then closely supervising the procedure, which is usually that prescribed by the State Sanitary Code by which local boards of health may order the abatement of public health nuisances. The use of untreated surface water supplies and the discharge of sewage or sewage effluents onto the surface of the ground in accessible locations are, of course, routinely declared to be public health nuisances.

SWIMMING POOLS AND BATHING BEACHES

The Sanitary Code provides for the operation of swimming pools and bathing beaches under permit of the local health officer and sets forth standards of operation. In addition, all

plans for new artificial pools or improvements to them must be approved by the State Department and operation records maintained and submitted to the local health officer and the district office of the state. The indoor pools or those operating over a reasonable period of time each year are under very good supervision.

In the summer resort county referred to above, it is estimated there are 500 swimming pools, all of which are out-of-doors and used only during the short summer season. Our records indicate that a rather large percentage of such bathing places are operated without permit and so without supervision, even by the local health officer. In some parts of the state there is consequently a big field for missionary work by the district engineer, but additional personnel is necessary before satisfactory conditions can be developed.

ASSISTANCE TO LOCAL HEALTH OFFICIALS

The advice and assistance of the district engineer is frequently enlisted and, in most communities where local engineering service is not available, he is considered as a regular consultant to the local boards of health. This assistance is particularly sought in the preparation of new local regulations and the conduct of legal proceedings, such as hearings by the health officer for the revocation of permits or by the boards of health for abatement of nuisances. The district engineers also are of great assistance to the part-time local health officials in dealing with matters which, because of their local color, are embarrassing for them to handle.

While the local health officers have a great tendency to shift to the district engineers as much of their non-medical work as possible, they are encouraged to do better work and in some cases to undertake new activities. A decided

improvement in the control of environmental factors by local health officials has resulted from the close coöperation of the district engineers.

MISCELLANEOUS ACTIVITIES

Besides the activities mentioned, there are a great many others, the number of which is ever increasing, carried on by the engineering personnel of the department. These include investigations of nuisance complaints, stream pollution studies, supervision of real estate developments (including checking of plans of water supply and sewage disposal services), investigation of watering points of interstate carriers, reviewing monthly reports of the local health officers covering their supervision of "Special A Raw" dairies, sanitary investigation of premises in connection with F.H.A. loans, operation of new provisions of the Sanitary Code specifying qualifications for water and sewage plant operators, coöperation with New York City in inspection of questionable water supplies of milk plants serving that city, addressing clubs and other gatherings on public health engineering subjects, and assisting in the conduct of extension courses for health officers.

Many of these important activities of course could not have been attempted without increased personnel, and the strategic locations of the engineers has helped materially in the successful accomplishment of these undertakings.

The public health engineering work

in New York State has progressed steadily, at least since 1921, and it is believed the establishment of the decentralized system has been the greatest factor in this progress and in providing increased service to the people of the state. The district engineers are as so many hands of the Director of the Division of Sanitation, with the fingers stretched into every community. The population at large is becoming more conscious of environmental public health work and is asking for more and more from the Division of Sanitation.

The Sanitary Code has placed additional responsibility on the local health officers, in many cases incompatible with the remuneration received. Many of these duties are of a non-medical nature, particularly those in connection with the control of milk and of the operation of camps and swimming pools. A majority of the part-time health officers feel these obligations too much of a burden and would like to be rid of them.

A logical extension or projection of public health engineering work in New York State, in the opinion of the writer, would be to relieve the part-time local health officers of some of their non-medical functions. With engineers working in small districts, this could be accomplished by providing additional personnel and by amending the Sanitary Code to provide for this control directly by the State Department and for permits to be issued by the Commissioner through his district representatives.

A Time-Study of Morbidity and Mortality in the United States Navy*

JOHN M. WHEELIS, JR., M.D.

*Lieutenant, Medical Corps, U. S. Navy, Washington, D. C.
In charge, Vital Statistics, Bureau of Medicine and Surgery,
Navy Department*

THIS paper is a preliminary report of research being done with morbidity and mortality records of the United States Navy. It deals principally with technic and basic data. The work is still in progress and only a partial report of results can be given at this time.

Unusual opportunities for research are offered by our data. The procedures for reporting sickness from the field are well defined and long established. The reports cover about 130,000 persons and come from all ships and stations of the Navy. When doing research in Washington, one may rightly consider that he has as field workers the 800 medical officers and a portion of the 3,700 hospital corpsmen of the Navy.

Regulations require that anyone not fit for duty at the time of morning sick call be placed on the sick list. Any disability of more than 24 hours' duration therefore becomes a matter of record and is reported directly to the Section of Vital Statistics in the Bureau of Medicine and Surgery.

These reports, though brief, contain all necessary data for complete identification of the individual and of his disability, including the number of sick days. These are known as Individual Statistical Report(s) of Patient(s). After having been edited and placed individually on tabulating cards, they become the most important single item in the medical statistics of the Navy. Although they are intended primarily for routine use, they are on file for past years and are available for research. They were used in the present study.

The purpose of this study is to determine what happens to persons as they enter the Navy and grow older in it. This defines *Length of Service* as the basic variable. To provide a more homogeneous group and greater statistical continuity, only the enlisted personnel of the Navy were studied. Naval officers, officers and men of the Marine Corps, nurses, midshipmen, and prisoners were excluded. The period of the study is the calendar years 1935 and 1936. About 175,000 person-years are represented.

Description of the population in terms of the basic variable involved considerable detail and some interesting methods.

In the Statistical Section of the Bureau of Navigation there is main-

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 27, 1938.

Submitted concurrently to the *U. S. Naval Med. Bull.* for publication.

NOTE: The statements herein presented emanate from the author, not from the Navy Department.

tained a living file of naval personnel. It consists of a tabulating card for each man. At the end of each year these cards are checked individually with the annual census from the field. Annually the numbers of personnel, by 4 year length-of-service groups, are reported. For the purposes of this study, the 4 year group was considered satisfactory for those with 4 years' service and over. It was considered necessary, however, to split up the under 4 year group much more finely. This was done by a life table method as will be described.

A man enlisting in January, 1931, would just complete 4 years' service in January, 1935, the first month of this study. In order to describe the under 4 year group completely for the years 1935 and 1936, it was necessary to follow, during their first 4 years' service, all men enlisting from January, 1931, to December, 1936, inclusive. The number enlisting each month during this time was obtained. Since these were derived from daily reports as received in the mails, they were adjusted for an average, 5 day, postal lag. Each of these groups was then followed separately by identifying, in the dead files, the cards of those who failed to survive their first 4 years' service, that is, the cards of those who left the service within their first 4 years. This produced 72 different survivorship records, beginning with successive months of enlistment, and ending with completion of 4 years' service or with the end of the study. After aligning them in stairstep fashion so that contemporary groups were side by side, it was easy to combine in any monthly grouping desired, during any calendar month of the study. The counts so obtained were adjusted arithmetically to the 15th of each month.

Monthly population figures for each of the groups with over 4 years' service were computed arithmetically from the counts as reported annually. Then,

for each of the 24 months of the study, figures were recorded for 13 length-of-service groups, as follows: less than 1 month; 1 month; 2 months; 3-5 months; 6-11 months; 1 year; 2 years; 3 years; 4-7 years; 8-11 years; 12-15 years; 16-19 years; and 20 years and over. Then, by re-combining these groups, totals were obtained for comparison with known monthly totals supplied by the Bureau of Navigation. The latter had also to be adjusted for a 5 day postal lag and from the last to the 15th day of each month. The range of error in the 24 totals was from 0.03 to 0.67 per cent and the average error was 0.20 per cent. These errors were adjusted.

A man may be taken up on the sick list in the Navy in any one of 5 different ways. A (new admission); ACD (a first admission for a condition which complicates, or follows as a sequel of, a contributory disability); EPTE (a first admission for a disability which existed prior to entry into the service); RA (a readmission for a disability previously taken up by any one of the 3 preceding methods); or, REM (remaining from the previous year). The sum of the first 3, A, ACD, and EPTE, represents the total number of first admissions. All 5 must be considered to determine the number of sick days.

Among other things, length of service and date of admission are shown on each sickness card. Through mechanical sorting and tabulation the data were arranged for recording on basic tables, one for each disability, or group of disabilities, considered. The numbers of first admissions were recorded in each length-of-service group during each of the 24 months.

The numbers of sick days were also distributed along the length-of-service and time variables. The technic for this was rather complicated but the results should be interesting since the

numbers of sick days represent the actual time lost due to sickness and are, along with mortality rates, the final measure of the effect of sickness in terms of loss of man power.

This work is being done in phases. The first is the communicable diseases, the second the acute respiratory diseases. One would expect close relation of the first to environment. Information is greatly needed about the second.

This report deals with the communicable diseases. They are loosely defined here as the single attack, droplet-transmitted, acute, specific infections. There were 2,899 such cases distributed as shown in Table I.

As men come into the service they arrive from all parts of the country. Some are from cities and have had frequent and diverse contacts with other people. Some are from rural areas where their contact rate was low. During the period of this study about 1,200 new men entered the service each month.

These new men are placed in one of

TABLE I

Distribution of Cases

German measles	1,132
Mumps	985
Lobar pneumonia	217
Measles	182
Scarlet fever	160
Chicken pox	103
Cerebrospinal fever	77
Septic sore throat	15
Diphtheria	15
Whooping cough	7
Lethargic encephalitis	3
Ac. ant. poliomyelitis	3
Total	2,899

4 training stations for their first 3 months' service. They undergo a common experience and are together in groups nearly all of the time. Although their new environment is well controlled and healthful, they are, nevertheless, epidemiologically crowded. Most of them are more crowded than they had been in civilian life. Probably very few are any less crowded. Upon completion of 3 months' training most of them leave for other ships and stations. Some remain for further training. In addition to these new men there are a certain number of older

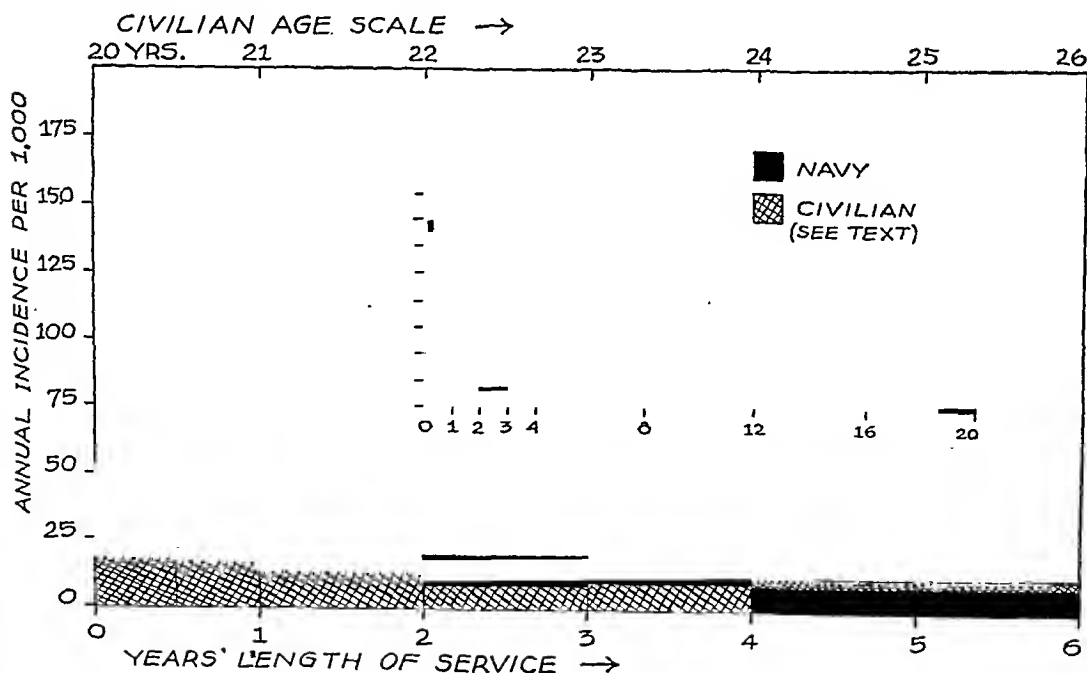


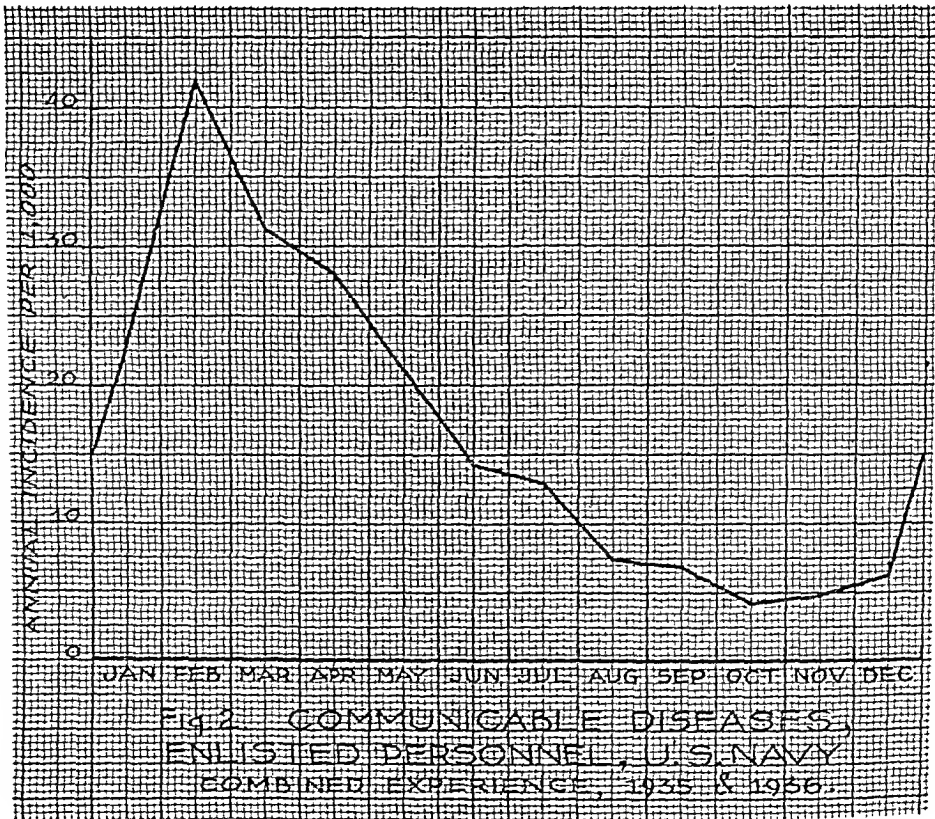
Fig. 1. COMMUNICABLE DISEASES, ENLISTED PERSONNEL, U. S. NAVY, 1935 & 1936.

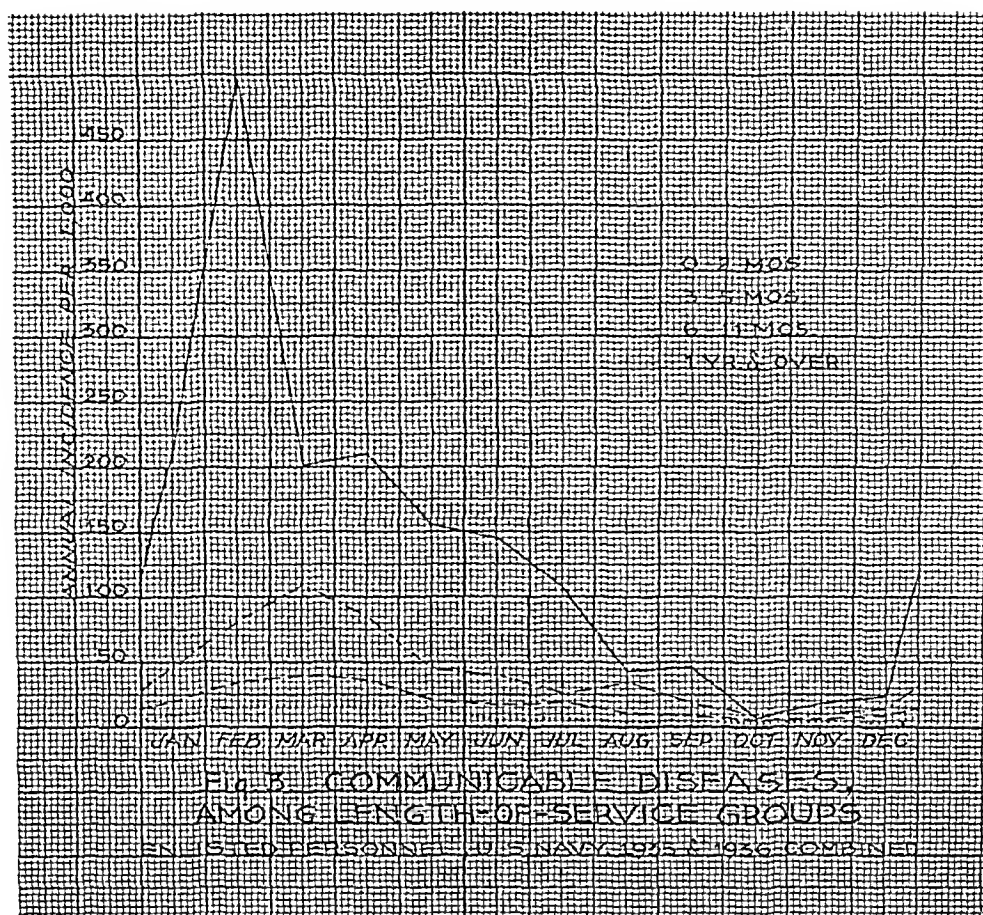
men at the training stations who act as instructors. After leaving the training stations, the new men intermingle with men of all lengths of service and gradually, themselves, grow older in the service.

From the foregoing it can be seen that this study is concerned with more than just the military aspects of changing length of service. We might say that we have a fixed experiment in human epidemiology. Our "herd," so to speak, is the enlisted personnel of the Navy. There is a constant flow of individuals into and out of the "herd." The new ones are placed in a "cage," the training stations. A certain number remain for as long as 7 months but most of them leave the "cage" after 3 months to mingle with the main "herd." A smaller number of the older members of the main "herd" return to the "cage" and are in contact with the new individuals. Having exact data on these movements of in-

dividuals and on associated morbidity and mortality, we can study them closely from the experimental epidemiological viewpoint.

We find that, upon combining the 2 years' experience, the person-years were distributed as shown in Table II. The numbers of communicable diseases were as shown in the third column, and the annual rates in the last column resulted. When the rates are put in diagrammatic form they produce the picture shown in Figure I. The solid bars represent our rates and the cross-hatched ones show age-specific rates taken from the report by Collins¹ of the incidence among 9,000 white families in 18 states surveyed during 1928-1931. Exact comparison of these two sets of rates is not attempted. The civilian rates are included merely as a physical basis for associative comparison. The average age at enlistment was 20.01 years. Age and length of service are necessarily closely correlated.





On this basis the civilian rates for the ages of 20 to 25 were considered to cover ages of men with from 0 to 5 years of service.

TABLE II

Person-Years and Numbers of Cases According to Length of Service

Length of Service	No. Person Years	No. Cases	Ann. Rate per 1,000
Less than			
1 month	2,492	129	51.77
1 month	2,427	399	164.40
2 months	2,455	424	172.71
3-5 months	7,209	321	44.53
6-11 months	13,654	255	18.68
1 year	21,707	363	16.72
2 years	14,293	253	17.70
3 years	10,000	167	16.70
4-7 years	36,686	315	8.59
8-11 years	27,871	146	5.24
12-15 years	22,983	80	3.48
16-19 years	13,545	44	3.25
20 years and over	991	3	3.03
Total	176,313	2,899	16.44

During the first month the annual rate of communicable disease incidence

is 51.8 per 1,000. During the next 2 months it rises to 172.7. This peak rate, for a group of men slightly over 20 years of age, is the same as that observed by Collins among children $9\frac{1}{2}$ or 10 years of age. The initial rise of incidence is steep and the subsequent drop precipitous. Within 2 months it drops to one-fourth of the peak rate, within 6 months to one-eighth, and within a year to one-tenth. It would be difficult to assume that these rapid changes in incidence are due to changing calendar age. That they are associated with changing environment and adaptation to it seems much more likely.

Seasonal factors are important in the incidence of these diseases. The seasonal curve for the entire group is shown in Figure II. The peak is in February and the trough is in October. The peak rate is about 10 times the trough rate.

TABLE III

*Monthly Incidence of Communicable Diseases by Length-of-Service Groups, Enlisted Personnel, U. S. Navy, 1935 and 1936 Combined **
Annual Rates per 1,000

	0-2 Months' Service	3-5 Months' Service	6-11 Months' Service	1 Year's Service and Over	Totals
January	213.77	48.31	19.86	11.08	22.84
February	498.00	79.73	33.66	18.36	41.98
March	200.33	107.83	37.75	18.57	31.17
April	209.83	85.03	36.77	16.92	27.89
May	156.58	45.87	20.13	14.53	21.04
June	145.90	40.97	17.30	6.81	14.29
July	105.92	25.93	19.41	6.69	12.76
August	43.63	34.91	12.06	3.71	7.23
September	46.55	18.17	8.63	4.22	7.06
October	9.99	10.70	5.31	3.50	4.24
November	17.98	10.29	3.89	3.98	4.88
December	24.82	14.27	10.40	4.65	6.36
Totals	129.09	44.49	18.68	9.32	16.44

* January, for example, represents the combined experience of January, 1935, and January, 1936.

It becomes of interest to know how the different length-of-service groups react to seasonal influences.

For convenience of the diagram and because the groups shown in Figure III are representative, the 13 length-of-service groups were combined into 4 as follows: 0-2 mos., 3-5 mos., 6-11 mos., and 1 year and over. Just as was expected from Figure I, the groups with less service have the higher incidence. Only in two instances do any two curves meet, and these are at trough levels. Also, the seasonal peaks flatten

out as length of service increases. In order to get away from absolute numbers and to examine more closely the proportional variations of the lower curves, the same seasonal rates were plotted on an arithlog scale in Figure IV.

Eighteen months are shown in order to avoid breaking the seasonal cycles. Each month represents the combined, corresponding months of the 2 years. For example, the January rate shown here represents both January, 1935, and January, 1936. The rates are on an

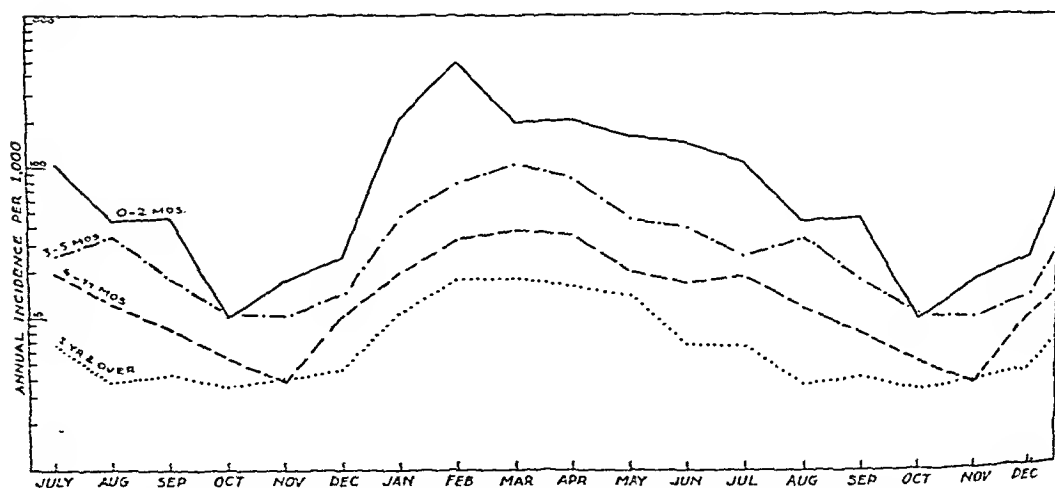


Fig. 4. COMMUNICABLE DISEASES BY LENGTH OF SERVICE
ENLISTED PERSONNEL, U.S. NAVY, 1935 & 1936 COMBINED.

annual basis. On the arithlog scale the flattening of seasonal peaks is still apparent. The ratio of peak to trough decreases as length of service increases. In ascending order of the 4 length-of-service groups, the ratios are 50:1, 10.5:1, 9.9:1, and 5.3:1. As length of service increases the peak tends to come later in the season. In Figure IV the abscissal scale is shown somewhat out of proportion in order to bring out this point.

No attempt is being made at the present time to draw conclusions from the facts which have been presented. Many more approaches are planned. Cook² observed that men entering the service during the fall and winter months suffer a much higher incidence of cerebrospinal fever during their first year than those entering during the spring and summer. It will be of interest to know to what extent this holds true for any or all of the other

communicable diseases and to split up the phenomenon by single calendar months of enlistment. It will also be of interest from both epidemiological and military points of view to know whether these differences during the first year are equalized during later years.

Throughout all of this work the training station population and rates can be separated from the others for comparison. It will be of particular interest to know the results of application of these methods to the acute respiratory diseases. Sick days, mortality, and fatality will also be analyzed in the same way.

REFERENCES

1. Collins, S. D. Age Incidence of Specific Causes of Illness. *Pub. Health Rep.*, 50:1404 (Oct. 11), 1935.
2. Cook, S. S. Incidence of Cerebrospinal Fever in the United States Navy as Related to Length of Service and Season of Enlistment. *Am. J. Hyg.*, 23:472 (May), 1936.

Progress Under the Operation of Title VI of the Social Security Act*

C. E. WALLER, M.D., F.A.P.H.A.

*Assistant Surgeon General, U. S. Public Health Service,
Washington, D. C.*

A WEEK seldom passes in which a request is not received by the Public Health Service from someone for a statement of progress made under the Social Security Act. As might be supposed, a large proportion of such inquiries come from members of the Congress; many come from students of sociology and government in colleges and universities, from women's study groups, research agencies, and magazines carrying both professional and popular articles.

It would seem a simple matter to write a report each year which could be printed and passed out in routine fashion that would serve current demands. Unfortunately this is not possible, since each request is more or less individualistic in the variety and combination of data for which it calls. With few exceptions, therefore, each inquiry must be handled from a separate viewpoint. Although the furnishing of this material in response to the various shades and varieties of demands becomes an irksome task, it is one which must be regarded rather in the light of an opportunity, since those who seek information become the mouthpieces

for spreading the message of accomplishment through the enlarged facilities which have been placed at our disposal.

A resumé of progress necessarily connotes a comparison of some kind. It would be fortunate indeed if there were some simple and reliable yardstick by which progress could be accurately gauged. Most desirable of all would be a precise measurement of the number of lives saved, the illness prevented, health and happiness promoted, and economic saving accomplished. It is believed, however, that the unequivocal answer to these questions will never be entirely satisfactorily determined on a quantitative basis. Failing in this, one turns next to a measurement of activities, extent of organization, enumeration of recruits to the public health personnel, and the amount of money spent in the extension of health service. Of this group of criteria the most significant is the activity record, though this is to a very large degree deceptive and unreliable as a means of evaluation of progress. In like manner the personnel employed and the health machinery established may be looked upon not as yardsticks of accomplishment, but as corroborative evidence only. Of all the indices of progress, the one most readily available and subject to accurate measurement is the amount of money

* Read before the Western Branch American Public Health Association at the Ninth Annual Meeting in Portland, Ore., June 6-8, 1938.

spent for public health work. The natural tendency, therefore, in estimating public health progress, is to resort to a listing of funds made available for health work, though in fact this is one of the least significant standards.

In an effort to portray the health progress made under the Social Security Act it will be understood that only the roughest sort of an estimation can be made by the use of any and all of the factors, whose limitations have been briefly pointed out. At best the tangible evidences of public health dividends are immediately discernible only in isolated instances. Occasionally some dramatic example of life saving or sickness prevention is observed. But public health expenditures must be looked upon as long term investments founded on faith in the efficacy of public health methods which are believed to be sound. Just as the horticulturist plants a tree knowing full well that he will have to wait several years for the harvest of fruit, so the public health worker must be reconciled to look for the full fruition of his labors within the next decade or possibly within the next generation. For the present, therefore, the report of progress must deal with evidences of means to the end rather than the end itself.

The Social Security Act is now well advanced on its third year of operation. Since the passage of the Social Security Act the maximum amount of money authorized has been appropriated each year. When it became effective in February, 1936, health organizations generally were at a low ebb. They had suffered heavily from reduction of funds in the economy wave associated with the general financial stringency. Many essential health services were crippled or discontinued because of the loss of personnel; and the morale of many of those who remained was sadly impaired as a result of drastic salary reductions.

The funds appropriated under Title VI of the Social Security Act brought welcome relief from these straitened conditions. A considerable portion of the Social Security funds was utilized to repair the breaches in the public health structure that had been created by the economic slump. After having done this, the state health authorities turned their attention next to expansion of existing health services and the addition of new activities.

One of the most significant outgrowths of the program under Title VI has been the movement toward higher standards for public health personnel. At the meeting of the State and Territorial Health Officers in 1936, qualification specifications were adopted with the view to eliminating the unfit from the ranks of public health service. Although these standards were not compulsory, they placed upon the state health officers a moral obligation to abide by them. The bane of the conscientious health administrator's hopes and ambitions has always been pressure from political influences for the employment of incompetent political favorites. Without recourse to qualification standards as a condition of employment the state health officers would have been hopelessly swamped with job seekers whose only claim for consideration was allegiance to some person or party. While this set of qualification standards was a life-saver to health administrators, it was also a two-edged sword. The state health officers found themselves suddenly in possession of greatly increased funds, and were confronted with the problem of how to use these funds in accordance with the personnel policy to which they had subscribed.

Trained personnel to fill new positions was almost wholly lacking. Although funds were made available for the training of personnel, it takes time to locate and select suitable trainees, and more time still to give the tech-

nical training. To meet this latter emergency, short or semester courses at training centers were instituted.

In both state and local health programs the personnel problem was a serious handicap in the beginning. In addition to this the local health program has been and continues to be in many localities retarded by the lack of local organization. It is generally conceded that local full-time health units wherever consistent with state laws and policies are the very backbone of a state-wide health program. Local health units, however, call for local appropriations to be pooled with funds from outside sources. It takes time, energy, and initiative to sell health units to local appropriating agencies. Even in those states where this work was vigorously undertaken, the time interval necessary for the consummation of local health budgets resulted in an accumulation of funds in state allotments which must remain unpaid until such time as budgets should be submitted for the operation of these projects.

The limitations which have been pointed out with respect to personnel and local programs account for the surpluses that accumulated during the initial stages of the operation of Title VI of the Social Security Act. At the end of the first 5 months, June 30, 1936, there was an accumulation of \$881,000 out of a total appropriation of \$3,333,000 for that period. At the end of the fiscal year 1937 (June 30), the surplus was \$1,116,000. The indications are that at the close of the fiscal year 1938 (June 30), the surplus will not exceed \$200,000. In each instance the surplus has been added to the appropriation for the ensuing fiscal year, and reallocated to the states. It is obvious from the foregoing that the expansion of health services has been stepped up to a level almost commensurate with the funds available. In fact, the machinery which has been de-

veloped now exceeds the facilities for maintenance at its present level, so that either more state and/or local funds will have to be secured in certain states, or activities will have to be curtailed.

As you probably know, the regulations governing the payment of funds from Title VI to the states specify certain matching requirements. Of special interest is the requirement which calls for the appropriation of new funds for public health work. The belief that this requirement has been effective in stimulating increased state and local appropriations is strongly supported by the figures indicating the excess of appropriations since the passage of the Social Security Act over the previous level. According to the latest data which were tabulated about a year ago this excess was estimated at that time to be at least \$7,500,000. Undoubtedly this figure has been materially augmented during the year following this tabulation.

How the states have invested the funds paid them from Title VI will be of interest as an indicator of the activities which are being most prominently featured. The following tabulation shows a general classification of purposes for which the sum of \$10,304,663.50 was budgeted by the states for the fiscal year 1938.

Prior to the inauguration of the Social Security program, 667 counties in the United States were listed as being served by full-time health officers. The number of counties so served as of December 31, 1937, was 1,166, from which it would appear that there has been an increase of 74.8 per cent in the number of counties under full-time direction, more or less directly as a result of aid extended through Title VI of the Social Security Act. There are 6 states completely covered by local full-time health service as compared with 3 on January 1, 1935. In spite of these highly encouraging facts, however,

PURPOSES FOR WHICH ALLOTMENTS TO STATES FROM FUNDS APPROPRIATED UNDER THE PROVISIONS OF SECTION 601, SOCIAL SECURITY ACT, FOR THE FISCAL YEAR 1938, WERE BUDGETED, TOGETHER WITH AMOUNTS THEREOF, AS OF JANUARY 1, 1938

<i>Purpose</i>	<i>No. of States</i>	<i>Amount</i>
Local Health Services	45	\$4,219,935.79
Training of Public Health Workers	51	1,485,467.29
Venereal Disease Control	43	827,325.56
Sanitary Engineering	44	539,559.52
Promotion and Supervision of Local Health Services	36	527,821.00
Laboratory Research	41	412,086.09
General Administrative Expenses	48	372,109.53
General Preventable Disease Activities	38	362,453.19
Industrial Hygiene	21	355,654.21
Tuberculosis Control	25	280,641.50
Vital Statistics	32	161,149.14
Public Health Nursing	21	144,370.00
Malaria Control	9	129,323.00
Health Education	23	112,613.00
Pneumonia Control	4	85,099.68
Dental Hygiene	8	70,615.00
Rodent Plague Control	5	58,748.00
Food and Drug Inspection	5	54,895.00
Trachoma Control	5	34,263.00
Cancer Control	5	29,614.00
Maternal and Child Health	7	25,540.00
Mental Hygiene	1	15,380.00
		<hr/>
	Total *	\$10,304,663.50

* Includes unexpended balances

there are still 10 states which have no local health service corresponding to the generally accepted standards implied by this term.

The stimulation of a new interest in industrial hygiene activities in state health departments has been particularly noticeable—funds allotted to this work having increased from approximately \$30,000 prior to 1936 to well over \$300,000 for the current year, and the number of states engaged in this work has increased from 3 to 23.

There has also been evident in the South a renewed interest in state health department facilities for malaria control.

The tremendous wave of public interest and enthusiasm in the campaign against syphilis speaks for itself and needs little comment here.

One of the most interesting developments in the program has been the increase in public health nursing service.

Between 1931 and 1937 the total number of public health nurses employed by local and state health agencies in the United States increased from approximately 16,000 to 18,000. This represented an increase of 22.3 per cent in nurses employed by official agencies and a decrease of 7 per cent in the number employed by nonofficial organizations. The most significant change has been noted with respect to rural areas, where there has been an increase of 32 per cent in the number of nurses since 1931.

Most of you are familiar with the program for training state and local public health personnel which was inaugurated in 1936 under the provisions of Title VI of the Social Security Act. It may be of interest to you to know that nearly 3,000 individuals had been given special postgraduate training in public health work up to June 30, 1937, and that during the current fiscal year

ABRIDGED REPORT—LOCAL HEALTH SERVICES EMPLOYING
TITLE VI FUNDS WITHIN THE STATE

	<i>Total this Period</i>	<i>Total this Year</i>
COMMUNICABLE DISEASE CONTROL		
Admissions to service (A 1)	333,735
Consultations with physicians (A 2)	68,422
Field visits (A 3-9)	487,650
Smallpox immunizations (A 15)	876,489
Diphtheria immunizations (A 16-18)	677,359
Typhoid fever immunizations (A 19)	1,660,265
VENEREAL DISEASE CONTROL		
Admissions to medical service (B 1)	363,810
Clinic visits (B 3)	2,175,267
Field visits (B 4)	160,603
TUBERCULOSIS CONTROL		
Individuals admitted to medical service (C 1)	135,508
Individuals admitted to nursing service (C 2)	153,859
Clinic visits (C 5)	202,659
Nursing visits (C 7, 8)	406,269
MATERNITY SERVICE		
Cases admitted to medical service (D 1, 8)	52,400
Cases admitted to nursing service (D 2, 7, 10)	164,633
Visits by antepartum cases to medical conferences (D 3)	84,666
Nursing visits (D 5, 6, 11)	471,173
INFANT HYGIENE		
Individuals admitted to medical service (E 1)	78,937
Individuals admitted to nursing service (E 2)	188,954
Visits to medical conferences (E 3)	155,837
Nursing visits (E 5, 6)	527,961
PRESCHOOL HYGIENE		
Individuals admitted to medical service (E 8)	144,449
Individuals admitted to nursing service (E 9)	259,655
Visits to medical conferences (E 10)	191,959

the number receiving training will be in the neighborhood of 1,300. Among those who have received training are 651 medical officers, 162 engineers, 1,540 nurses, 451 sanitation officers, 88 laboratory workers, and 60 others. More than 200 medical officers will have received a full 1 year course in public health administration at the close of the current year, and 161 nurses will have been given a whole year of postgraduate work.

It is impossible to devise any reporting system that will accurately record all services performed by local health units. Even the most extensive report forms will not do this. It is, however, incumbent upon the Public Health Service to secure some record of activi-

ties carried on with Social Security funds. For this purpose an extremely abridged report consolidated for all local health services employing Title VI funds within a state is required quarterly, with the view to securing a representative cross-section of work performed. There is herewith presented the consolidated report from all the states for the fiscal year 1937, which will serve to convey some idea of the volume of local health work in progress. It should be noted, of course, that this work is financed only in part (roughly 50 per cent) by Social Security funds.

If public health is to pursue a course of progress its program should be readily adjustable to varying needs and circumstances. Local problems are en-

ABRIDGED REPORT—LOCAL HEALTH SERVICES EMPLOYING
TITLE VI FUNDS WITHIN THE STATE (cont.)

	<i>Total this Period</i>	<i>Total this Year</i>
PRESCHOOL HYGIENE (cont.)		
Nursing visits (E 12, 13)	522,542
Inspections by dentists or dental hygienists (E 14)	48,484
SCHOOL HYGIENE		
Inspections by physicians or nurses (F 1)	7,617,214
Examinations by physicians (F 2)	1,181,080
Individuals admitted to nursing service (F 4)	1,431,642
Nursing visits (F 5, 6)	2,040,995
Inspections by dentists or dental hygienists (F 7)	651,940
ADULT HYGIENE		
Medical examinations (G 1-5)	179,417
MORBIDITY SERVICE		
Medical visits (H 3, 4)	433,013
Nursing visits (H 5, 6)	524,766
Admissions to hospitals (H 7)	44,845
GENERAL SANITATION		
Approved individual water supplies installed (J 1)	15,483
Approved excreta disposal systems installed (J 2, 3)	199,960
Field visits (J 4-11)	1,714,628
PROTECTION OF FOOD AND MILK		
Food handling establishments registered for supervision (K 1)	155,491
Field visits to food handling establishments (K 2)	523,315
Dairy farms registered for supervision (K 3)	62,350
Field visits to dairy farms (K 4)	141,751
Milk plants registered for supervision (K 5)	12,162
Field visits to milk plants (K 6)	45,000
LABORATORY		
Specimens examined (L 1-21)	2,785,744

countered in some states which are non-existent in others; problems common to all states require in some states a heavier weighting in the health program than is given in others. The advancement of basic scientific knowledge, changing public sentiment, and changing social conditions are ever introducing new problems to which the public health program must be adjusted. For these reasons a progressive public health program is flexible, and responsive to new ideas. In this connection I would invite your attention particularly to some of the broader phases of public health responsibility. In the address of Josephine Roche, Assistant Secretary of the Treasury, at the meeting of the American Public Health Association in New York, she clearly defined one of

the most urgent issues in the following language:

The challenge which confronts public health workers today is in essence the same as that which confronted the great leaders of the past when human life was wiped out by epidemics and infectious diseases. The objective for which they strove is identically the same as yours today—to save life, conserve health, to prevent death and disease. So, as I stated earlier, you take on no new function when you turn to new ways and means to meet this unchanging objective. You only face the fact that your battle in the laboratory to find and conquer the causes of destructive diseases, and in the field to apply this knowledge, must not only be continued but widened and extended to the social and economic front. Death and disease are no less your responsibility to prevent because the cause for them has shifted, demanding care of the individual by public means when that individual's economic status makes im-

possible his securing for himself medical care and facilities necessary for saving life or health.

An appraisal of progress in public health service under the Social Security Act must take into account the degree to which public health workers have attuned themselves to the opportunities

for life saving, by whatever means, in the future. This question can be answered only by each one of you individually. The future destiny of public health as a factor in our social structure will depend in a large way upon the intelligence and courage with which this challenge is met.



Annual Roll Call November 11-24, 1938

Fleas as Vectors of Plague*

C. R. ESKEY, M.D.

*Senior Surgeon, U. S. Public Health Service Laboratory,
San Francisco, Calif.*

IT is now well established that fleas are capable of transmitting plague from one host to another. Innumerable species of these parasites have been found on animals throughout the world. Over 80 species have been collected from wild rodents in our western states and new ones are being discovered every year.

As a rule one species of animal seldom acts as the natural host for more than 3 or 4 species of fleas in the same locality, and sometimes for only one. Some varieties of fleas may naturally infest several species of animals, but usually such hosts belong to the same generic group. A few, like the sand flea, appear to utilize almost any animal as their normal host. When different kinds of animals live in close association or come in contact with each other, fleas peculiar to one may be found on others that are not their usual hosts. That fleas may subsist for long periods on blood of animals foreign to them has been demonstrated in the laboratory by keeping many different wild rodent fleas alive for 2 to over 5 months when fed on guinea pigs.

Animals that continually live in the same nesting place, as is usually the case of those dwelling in burrows, harbor more fleas than those that use their nests only for rearing their young.

When ground squirrel nests are excavated during the summer, one may see enormous numbers of larvae wiggling about in them, and it is often possible to collect many adult fleas from the nests. Therefore, in determining the extent of the flea infestation of rodents, one must take into consideration the insects that are present in the nesting places as well as those found on the animals.

Climatic conditions play such an active part in determining the prevalence of fleas infesting domestic rodents that in some localities having unfavorable climates there are insufficient vectors to cause plague epizootics. The potential danger of plague becoming established among wild rodents of any region has little relationship to its climate, being chiefly dependent upon the kind of rodents present and the extent of their population, because wild rodent fleas are as acclimated to their environment as are their wild hosts.

Experimental transmission of plague by fleas—The usual procedure followed in testing the ability of fleas to transmit plague by placing them on an infected rodent, then, after its death, allowing the exposed parasites to infest another animal, provides very little information regarding plague infection of fleas. Positive results obtained from such experiments might be due to infected flea feces rather than to the bites of the insects.

* Read before the Western Branch American Public Health Association at the Ninth Annual Meeting in Portland, Ore., June 6-8, 1938.

During the past 2 years experiments have been conducted at the Public Health Service Laboratory in San Francisco in which approximately 1,200 fleas have been tested individually; that is, each flea has been kept in a test tube from the time it was collected until its death. This method provides exact knowledge regarding the time that fleas become plague infected; the period that elapses before they transmit the disease; the length of time the insects survive infection; and, the identity of each flea can be ascertained after its death. Plague infection of living fleas can be determined by inoculation of their feces, and of dead fleas by injecting their bodies into guinea pigs.

Infesting fleas with plague—From the literature on plague one might gain the impression that a flea which has fed at any time on an infected animal might transmit the disease. In reality there is only a short time before death from acute plague that there are sufficient organisms in the blood to infect fleas. The blood of guinea pigs has not been infectious to fleas earlier than 36 hours before death and it is probable that fleas are not infected by the blood of other rodents over a longer time. During this short interval before death the degree of septicemia varies greatly in different guinea pigs. *Pasteurella pestis* may be found in every microscopic field of the blood smears of some acutely sick animals, while in others, blood cultures are required to demonstrate the organisms. As would be expected from the results of blood examinations, the percentage of fleas infected experimentally after feeding on different animals has varied greatly. In most cases only a very small number of fleas have been infected even when the blood examination demonstrated that it contained many organisms, and in no instance has it been possible to infect all fleas fed on one animal. In view of these observations it may be stated

that when plague infected animals are killed during the early stages of the disease, or before the development of septicemia, none of the fleas on the animal will have been infected by its blood. Furthermore, even when animals have died of plague, only a small percentage of the fleas on the dead hosts are liable to be plague infected, because only a portion of the fleas that have fed during the septicemic period will be infected, and some fleas do not feed often enough to have ingested blood at this time.

It is doubtful whether fleas ever become infected by feeding on sick animals that recover from acute illness, or that have mild sub-acute infections. In one instance during the experiments at San Francisco a large number of fleas were fed daily for 3 days on a guinea pig that appeared to be so ill each day that it would die in a few hours, and then it began to show signs of improvement which went on to complete recovery. None of the parasites that fed on this animal were infected and blood cultures made during the 3 days of acute illness remained sterile. This guinea pig was inoculated again with plague and recovered a second time.

Multiplication of Pasteurella pestis in fleas—During the act of feeding, blood passes through the esophagus into the proventriculus, and then through a short tubular structure into the stomach proper. The blood is stored during digestion in both the proventriculus and stomach so that ingested bacteria may multiply and form clumps in either organ. More than one mass may be present in the stomach and remain discrete for a long time or coalesce with the formation of one large growth. The rapidity with which the masses grow varies greatly in different fleas. In some only small clumps are present after two or more months, while very rapid growth may occur with extension of the masses into the proventriculus.

In many instances the stomachs are greatly distorted in shape and size by the bacterial growths and have a rather characteristic appearance, being contracted into a more or less tubular form with jagged margins.

Bacterial growths in the proventriculus produce great enlargement of this structure and nearly always extend forward into the esophagus, causing it to be distorted and dilated. Whether or not the masses formed by *P. pestis* develop primarily in the proventriculus or invade it from the stomach, the end results are the same, leading eventually to partial, and then complete obstruction of the esophagus. This blockage has been observed to occur as early as 4 days after plague infection, or it may not develop until several months after ingestion of *P. pestis*. In the case of a number of fleas killed over 3 and 4 months after infection there were no visible masses in the proventriculus and only small bacterial growths were seen in their stomachs.

The dark brown masses formed by the multiplication of *P. pestis* in fleas are not solid clumps of viable organisms but are composed chiefly of colloidal-like material so adhesive that the masses can usually be dissected out intact, and require rough handling to tear them apart. In stained specimens coccobacilli are found in large numbers on the surface of the growths, on the adjacent membranes of the stomach, and in any fluid that may be present.

Transmission of plague by flea bites

—From such information as one may obtain from textbooks it would seem that when a host is bitten by a plague infected flea infection will naturally follow the bite. This idea is further from the truth than the belief that all fleas which have fed on an infected animal will be carriers of plague. In San Francisco over 300 fleas have been infected, and they have fed several thousand times and still their bites have

not been infectious. There were individual infected fleas that fed from 50 to 100 times on guinea pigs without transmitting plague. Less than 10 per cent of wild rodent fleas acted as vectors in the laboratory, indicating that in nature only a very small percentage of fleas which have fed on infected wild rodents will really infect other animals by their bites.

As long as the bacterial masses do not prevent the passage of ingested blood into the stomach the bites of plague infected fleas are harmless. It is only after development of obstruction to the flow of blood and regurgitation which carries the organisms into the wound occurs that the bites of fleas are infectious. In the course of experiments fleas have transmitted plague as early as 5 days and as late as 147 days after they had ingested *P. pestis*.

Normal fleas of nearly all species seldom insert their proboscides more than once and satisfy their hunger in less than 5 minutes, while the efforts of blocked fleas to feed are often characterized by prolonged exertions to secure blood in one place, or by shifting from one site to another, until they apparently become exhausted. Sometimes a tiny drop of regurgitated blood exudes from the proboscis of an obstructed flea when it is withdrawn from the skin. Many fleas with complete obstruction of the esophagus fail to transmit plague regardless of how prolonged their exertions to feed have been. This may be due to the fact that the blocked fleas are too weak for their efforts to cause regurgitation, or the organisms are not detached from the bacterial growths to be carried into the wounds. After death the obstruction of the esophagus is easily seen with the microscope and frequently fresh red blood is visible in the esophagus in front of the obstructing mass.

Period fleas are infectious—Very few infected fleas survived more than 24

to 48 hours after there were indications that there was an obstruction to the flow of the blood meal to the stomach, regardless of whether or not their attempts to feed were infectious. Of the 45 fleas which transmitted plague in the laboratory only about 20 per cent infected more than one animal, although some of those that failed to cause multiple transmissions attempted to feed after they had infected one guinea pig. Five fleas infected 3 to 5 guinea pigs and one infected 10 animals. This latter flea and one that infected 5 animals transmitted the infection for 5 and 10 days respectively. The infectious life of these 2 fleas was exceptionally long because most blocked fleas live only a short time and few of them are capable of infecting more than one host before they die.

Transmission by male and female fleas—Although many male fleas of different species were used in the laboratory experiments, only 2 of the 45 that transmitted plague were males, which is rather conclusive evidence that female fleas are much better vectors than males.

Plague infection of different species of fleas—During the experiments in San Francisco it has been possible to demonstrate plague infection of 20 different species of fleas, 15 of which were collected from wild rodents, 3 from domestic rats, and 2 miscellaneous fleas. Of the different species found to be plague infected only 11 transmitted the infection to guinea pigs. Domestic rats, prairie dogs, chipmunks, and several varieties of ground squirrels acted as the natural hosts of the fleas which were vectors of plague in the laboratory. Failure to obtain experimental transmission with certain species of fleas does not prove that they are incapable of acting as transmitting agents. In fact the results of laboratory investigation tend to indicate that any flea, regardless of species, that feeds on

septicemic blood may become plague infected, and later blockage of the esophagus may occur which would make the flea a potential vector.

Although there is a possibility that all fleas may act as transmitting agents of plague, epidemiological data and laboratory studies clearly demonstrate that the rat fleas, *Xenopsylla cheopis*, are much more active and dangerous vectors of plague than any others tested. A second species of rat fleas, *Nosopsyllus fasciatus*, was found to be as capable of transmitting plague as any of the wild rodent fleas. Some species of fleas seem to be very feeble vectors.

When compared with all other species studied, *Xenopsylla cheopis* are considered the most efficient transmitting agents because they are more readily infected when fed on septicemic blood, and they transmitted the disease to many more guinea pigs. They also tend to become blocked earlier and to remain infectious for a longer time than other fleas. Blocked cheopis are very persistent in their efforts to obtain blood and in many instances they produced 2 to 5 foci of infection on the abdomen of guinea pigs where they had made wounds in their attempts to feed. Some cheopis appear to be capable of infecting guinea pigs every time they insert their proboscides. Multiple foci of infection rarely followed the bites of any fleas except cheopis.

The average length of life of plague infected *Xenopsylla cheopis* is less than 1 month due to the early involvement of their proventriculus by the bacterial growth. Many cheopis did not survive infection 2 weeks, and the longest that any of them lived was about 50 days, while many infected fleas from wild rodents and the rat fleas *Nosopsyllus fasciatus* remained alive from 2 to over 4 months before they became blocked and died.

If different species of fleas do not have the same ability to transmit

plague, and if the infection persists much longer in some species than others, it may be assumed that the character of plague epizootics will vary according to the kinds of fleas involved in its dissemination. For instance, an epizootic in a community where *Xenopsylla cheopis* are prevalent should be much more severe and accompanied by a greater incidence of human infection than would be the case in a locality where the spread of the infection depended on one or more of the other species of fleas studied in the laboratory. On the other hand, in regions where cheopis are the only rodent fleas present to maintain an epizootic, and conditions arise which tend to cause the disease to subside in rodents, so that its continuation depends upon the persistence of the infection in fleas the epizootic would be more likely to disappear than would be the case if other fleas were present, such as *Nosopsyllus fasciatus*, which may remain infected for a much longer time than cheopis. Wild rodent fleas may remain infected for several months so that it is possible for plague infection to be carried over the hibernating period of wild rodents in fleas.

Plague infection of flea feces—Virulent plague bacilli can be demonstrated in the feces of nearly all plague infected fleas by inoculation into guinea pigs. Some species of fleas do not excrete virulent organisms as constantly as others. The length of time fleas have been infected does not affect the virulence of the bacteria in their feces. In some cases the inoculation of excreta collected at the time fleas have died has produced plague in guinea pigs when injection of the fleas gave negative results.

Since Bacot and Martin demonstrated that fleas transmit plague when feeding, the old idea that transmission followed rubbing infected feces into minute wounds has been more or less

discarded. However, it is possible that plague is disseminated among rodents much more frequently through the agency of infectious feces than is generally believed. It is difficult to understand how rodents escape infection in this manner when we consider that one or more infected fleas may live for several months on their hosts and during this time continually deposit large numbers of virulent plague organisms in the fur and on the skin of rodents which will cause infection if rubbed into minute abrasions. It is not necessary for the infectious feces to gain entrance to the hosts' bodies immediately after they have been deposited in order to induce infection because recent experiments conducted at San Francisco have shown that *P. pestis* may retain its virulence as long as 4 weeks in dried flea feces kept at room temperature.

It is unlikely that humans contract bubonic plague through the agency of flea feces because rodent fleas do not remain with human hosts for a very long time and there is slight chance for them to deposit feces on the skin of man. Fleas rarely defecate when feeding and the lesions of rodent fleas seldom cause itching.

Tendency of rodent fleas to attack man—It has been known for many years that domestic rat fleas often bite man, but there is little knowledge regarding the facility with which wild rodent fleas will attack humans. From the fact that 6 different species of sylvan fleas—or all that have been tested in sufficient numbers at the laboratory in San Francisco—have been found to feed on human blood, it may be assumed that many species of wild rodent fleas will bite man. In one instance 18 fleas were collected from a ground squirrel nest shipped to the laboratory and each flea as captured was placed on the arm of one of the workers with the result that 17 of them fed almost as soon as they touched the

skin. It has been possible to keep several kinds of wild rodent fleas alive for a number of days by feeding them on human blood, but others of the same species died of starvation before they would feed on man. Our observations have shown that all rodent fleas have to be starved to a greater extent before they will accept human blood than is required for them to feed on rodents that are not their natural hosts. Many fleas that have refused to bite man were found to feed at once when placed on rats or guinea pigs. From these findings it would appear that starved, blocked, plague infected fleas of wild rodents may attack man when they come in contact with the skin so that there is danger of humans contracting bubonic plague in all regions where wild rodents are infected.

CONCLUSION

Twenty different species of fleas have been infected with plague in the laboratory but only 11 species, 9 of which were collected from wild rodents, transmitted the disease to guinea pigs; only

a portion of fleas fed on plague infected guinea pigs a few hours before the animals died were infected, and of those infected only a small percentage transmitted plague to other guinea pigs. Flea bites are not infectious until the masses formed by *P. pestis* cause obstruction of the esophagus. This condition may develop in a few days or not for over 4 months. Few fleas ever infect more than one animal and blocked, infectious fleas generally die within 48 hours of the time there is evidence of obstruction to their stomachs.

Infected fleas are constantly excreting virulent coccobacilli in their feces which may survive for as long as 4 weeks in the dried excreta so that rodents are exposed to infection from the feces as well as the bites of fleas.

There is always a possibility of humans contracting bubonic plague from blocked fleas present on wild rodents in regions where sylvatic plague exists, but these fleas are not nearly so dangerous to man as the domestic rat fleas, *Xenopsylla cheopis*.

PROTECT

YOUR HOME FROM
TUBERCULOSIS



BUY CHRISTMAS SEALS

Christmas Seal Sale 1938

Thanksgiving Day to Christmas

Tenure of Office for Health Officers*

JOSEPH W. MOUNTIN, M.D., F.A.P.H.A., AND
ELLIOTT H. PENNELL

*Senior Surgeon, and Associate Statistician, U. S. Public Health
Service, Washington, D. C.*

FROM groups concerned with health organization often come assertions to the effect that health officials as a class occupy positions where tenure is insecure and of short duration. If such statements be true and generally applicable, public health administration faces a serious problem. There is little hope of professionalizing a position where constant turn-over is the rule; neither can a community expect effective service from a health department that operates under shifting management. Strange as it may seem, these commonly held notions of instability with respect to tenure of office appear to have developed from limited observations or general impressions; a careful search of the literature failed to disclose any comprehensive analysis of the situation based on the actual employment records of persons who had served in the capacity of health officer. Under the circumstances it seemed appropriate to study in a quantitative way the experience of health officers, using as source material such recorded information as may be available.

The employment records used for this study are taken from the directories† of state, county, and city health officers published annually by the U. S. Public

Health Service. Supplemental information in respect to age and professional degrees was taken from directories of physicians published by the American Medical Association, and from lists of members published by the American Public Health Association. In the directories of health officers are enumerated all state health officers, health officers of cities containing 10,000 or more inhabitants, and officers in charge of county health departments. The names of village and township health officers and of county physicians are not included in these publications. Appearance or nonappearance of a name in the directories of health officers is accepted as the criterion of employment. This method introduces some degree of error because of the vagaries of reporting, but the resulting discrepancies do not distort the picture in any appreciable degree. It must be understood that disappearance of a name from the registers does not necessarily signify that the person has abandoned public health as a profession; he may continue to occupy some position other than administrative head of a tax supported health department listed in the specified directories. No doubt a few died in office, but information for correcting the data on this point was not readily avail-

* From Division of Public Health Methods, National Institute of Health. Read before the Health Officers Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

† Periods covered by these directories are: State 1912-1935, city 1916-1935, county 1922-1935. County data for period 1908-1921 taken from *Public Health Bulletin* 222.

TABLE I

Distribution of Health Officers According to Total Full-time Employment Experience and Status at Close of Study (1935)

<i>Employment Status at Close of Study</i>	<i>Total Health Officers</i>	<i>Accumulated Years of Employment</i>	<i>Average Years of Employment</i>
Still employed	793	6,186	7.8
Out of office	1,591	5,730	3.6
Total	2,384	11,916	5.0

able; here too it is believed that the inherent error is of little moment.

Part-time service has been excluded from the more detailed analyses since data on individuals so employed are rather fragmentary; furthermore, progress in public health organization is believed to be more intimately tied up with the fate of full-time employees than of those who regard health administration as a subordinate occupation. It was also deemed advisable to exclude from consideration persons whose names appeared only in the health officer directories for the last year of study. These health officers, though on active duty, had not completed a full year of service; hence their experience was not adapted to the categories used for this analysis.

In the data presented through this report are represented the employment histories of 2,384 full-time health officers who by health jurisdictions are distributed as follows: state 127, city

982, county 967, and 308 who served in more than one type of jurisdiction. The total employment period may be expressed as 11,916 health-officer years, and the average period as 5 years (see Table I). At the close of 1935, the last year of study, 1,591 health officers were no longer in office, while 793 still retained their positions. For the former group the average period of employment was 3.6 years, and for the latter it was 7.8. Among the discontinued group about 50 per cent had completed their experience in 2 years or less, and nearly 75 per cent served less than 5 years (Table II). For the group in office at the close of the study the corresponding percentages were much better, being roughly 12 and 33. In the zone of long-term employment periods the relative performance of the two groups is very similar; about 10 per cent of the group with completed experience served 9 years or more, while 35 per cent of those in office at the close of the study had been there for a similar period. The same material is presented graphically in Figure I by means of the median and interquartile range.

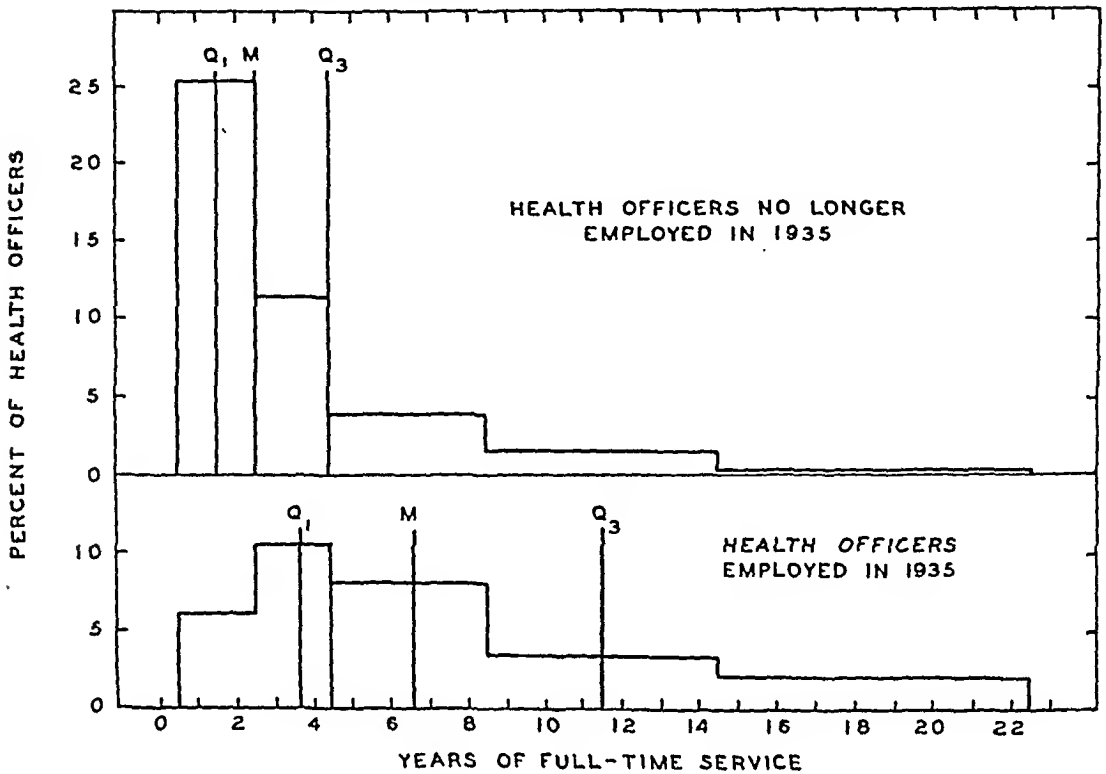
For the group no longer in office at the close of the study the employment period, as expressed by a median, is 2.4, and for those still employed it is 6.7. The configuration of the curves and the range of the middle 50 per

TABLE II

Distribution of Health Officers According to Years of Full-time Service

<i>Years of Service</i>	<i>All Health Officers</i>		<i>Health Officers No Longer Employed</i>		<i>Health Officers Still Employed</i>	
	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>
1- 2	912	38.2	818	51.4	94	11.9
3- 4	533	22.4	364	22.9	169	21.3
5- 8	516	21.6	263	16.5	253	31.9
9-14	288	12.1	126	7.9	162	20.4
15 and over	135	5.7	20	1.3	115	14.5
Total	2,384	100.0	1,591	100.0	793	100.0

FIGURE I—Distribution of health officers no longer employed and of those employed in 1935 according to years of full-time service

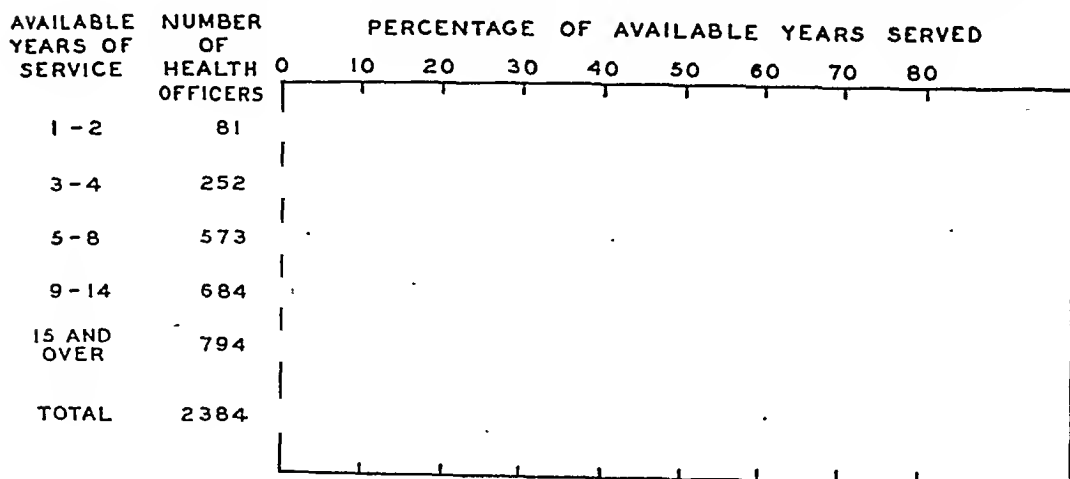


cent also serve to illustrate the differences in employment pattern of the two groups. This behavior suggests a high rate of discontinuance early in the employment history of health officers, while those who weather the elimination process tend to continue as chief administrators for a considerable period of time. There is no way from our basic data of determining the extent to which early separation is voluntary and how much is due to failure of the person to secure reemployment.

To measure completed service is a rather simple matter since the dates of entrance on duty and of termination of employment are known. On the other hand, there is no basis for predicting how long a person employed at the end of the study period might continue to fill the office. In order that all health administrators may be judged on a comparable basis with respect to their retention of position, a period extending

from the date of entrance on duty into the last year of study (1935) was taken to represent the available period of employment. Health officers were then classified on the ratio of their actual years of employment to the total available period. For example, a person who became health officer in 1929- might have continued for 6 years; if he remained 3 years he would have completed only 50 per cent of the available period. Stability of positions expressed as the ratio of actual to available years of service (Table III) is presented graphically in Figure II. Taken together health officers classed as having from 2 to 4 years of available employment served during more than 70 per cent of it; those with from 5 to 8 years of available employment were in office nearly 60 per cent of the period, while the ones that had 9 or more years during which they might be employed actually were reported in office less than

FIGURE II—Distribution of health officers according to available years of full-time service and the proportion of available years served by health officers in the several groups



45 per cent of the available period. It is to be expected, of course, that the proportion of actual to available years of employment should grow less as the period of possible service lengthens. However, the relatively good showing made by the small group who took up full-time work early, clearly demonstrates that discontinuance is not a simple straight line function of length of employment. In this connection it is well to recall the data presented in Table II; there it was shown that there is a tendency for health officers either to drop out of the directories after a short period of service or to continue in the capacity of chief executive over a considerable span of years.

The period of part-time employment was recorded for 311 health officers who also had full-time service. By adding the two periods, the average employment experience of the in-service group having both full- and part-time health officer service would be increased by 67 per cent; and for the discontinued group the corresponding percentage increase would be 80.

From the foregoing data and other points that might readily be adduced it becomes apparent that health officers

behave quite differently with respect to their period of employment. This suggests the possibility that some factors common to a significant number of individuals may account for these differences in employment pattern. The information at hand, though fragmentary, covers such points as date of birth, age when first appointed, and professional degrees of the health officer; while relative to place of employment source material pertains to type of health jurisdiction and its geographic location. Even though the findings are not altogether conclusive, there are associations between different circum-

TABLE III

Distribution of Health Officers According to Available Years for Full-time Service and the Proportion of Available Years They Were Actually Employed

Available Years	Number Health Officers	Accumulated Years Available	Percentage of Available Years Employed
All years	2,384	26,687	44.7
1-2	81	162	78.4
3-4	252	911	72.9
5-8	573	3,758	59.5
9-14	684	7,856	44.3
15 and over	794	14,000	37.4

TABLE IV

Median Years and Interquartile Range in Full-time Employment for Health Officers Having Different Characteristics

<i>Characteristics</i>	<i>Total Health Officers</i>	<i>Years of Experience</i>	
		<i>Median</i>	<i>Interquartile Range</i>
All health officers	2,384	3.4	1.6-6.8
With professional degree	1,865	3.4	1.6-6.8
Without professional degree	519	4.1	1.8-7.0
Under 45 years on entrance *	1,009	3.4	1.7-6.4
Over 45 years on entrance *	768	3.9	1.9-7.2
Employed one place	1,953	2.9	1.4-6.0
Employed more than one place	431	6.0	3.7-9.3

* Information on age of health officers was limited to physicians whose ages were listed in American Medical Directory.

stances that appear worthy of presentation. In this connection it should be recalled that full-time service is a relatively new departure in most health jurisdictions. At the close of the study only a small proportion of what promises to be a stable group of officials had completed their employment experience; hence the effect of this group on the mass is obscured when the years of service for health officers in various categories are reduced to a mathematical expression.

While it is true that persons in office at the close of the study period show much better performance with respect to total years of employment and proportion of actual to available years, yet the two groups react quite similarly to the influences on employment that have been selected for study. Because of this circumstance and the necessity for simplicity in presentation, both groups have been combined and their behavior is reviewed from the standpoint of length of employment. This period is expressed by the use of a median and the range of the middle 50 per cent. The factors under consideration are divided into two classes: those listed in Table IV are inherent characteristics of health officers, and those in Table V pertain to the jurisdictions where the health officers are employed.

The health officers whose manner of listing in the directories would indicate special training that led to a professional degree present employment records of duration considerably below those without such attainments; the median for the former group being 3.4 and for the latter 4.1. While the figures are impressive, this difference may have little meaning since difficulty was encountered in classifying training from the information at hand; furthermore there is reason to believe that the directories were both deficient and inconsistent on this point.

Age was studied for its possible effect on length of employment. By using 45 years as the critical point, it was found that those above showed a median period of 3.9 years, and those below, 3.4. This small difference is hardly sufficient to suggest that age is any great factor. The slightly better showing of those in the older group may be due to their having had an opportunity to accumulate more years of full-time service than those who were unable to qualify for positions until recent years. Clearly, persons who accept positions in two or more health jurisdictions are likely to accumulate additional years of employment above those who remain in one place. The median years of employment for the migratory health officers

TABLE V

Median Years and Interquartile Range in Full-time Employment for Health Officers Serving Jurisdictions Having Different Characteristics

<i>Characteristics of Jurisdictions</i>	<i>Total Health Officers</i>	<i>Years of Experience</i>	
		<i>Median</i>	<i>Interquartile Range</i>
Type of jurisdiction			
State	127	4.3	2.4- 8.1
County	967	3.0	1.4- 5.6
City	982	3.0	1.5- 6.5
Combinations	308	6.8	3.8-11.3
Location			
New England, Middle Atlantic	490	3.6	2.0- 8.8
South Atlantic, E. South Central, W. South Central	1,115	3.5	1.5- 6.5
East North Central, West North Central	544	3.4	1.5- 6.5
Mountain, Pacific	235	3.1	1.4- 6.3

is 6.0 and for the stationary ones it is 2.9. Migration, however, is not an outstanding characteristic of health officers as a class since only 431 moved, while 1,953 completed their recorded experience in one place. Most of this limited experience was reported by county health officers.

The region where a health officer is employed seems to exert as much if not more influence on his tenure as do those personal qualities which are discernible from data that describe the group under consideration. In studying the possible effect of circumstances surrounding employment, one finds slight geographic differences. Health officers employed in the Mountain and Pacific areas show a period of employment shorter than is the case for other sections of the country. The median years of employment in the areas used for this study are as follows: New England-Middle Atlantic 3.6; South Atlantic-East South Central-West South Central 3.5; East North Central-West North Central 3.4; Mountain-Pacific 3.1. The difference in performance between the Mountain-

Pacific group and the remainder of the country, while of a low order, may be accepted as having some statistical significance.

Health officers of cities and counties show the shortest period of employment with a median of 3.0 years. The position of state health officer is somewhat more stable and represents a median period of 4.3 years, or more than 1 full year above that reported for county and city health officers. Health officers who secure successive employment in more than one type of health jurisdiction lengthen their period of service to a median of 6.8 years. This longer experience is in accord with the observation previously noted that health officers who change their location thereby increase their years of employment.

It is entirely possible that opportunity for accumulating years of full-time service in jurisdictions of one type as contrasted with another may explain differences in periods of employment. The establishment of full-time positions for health officers in a sig-

TABLE VI

Distribution of Health Officers According to Period of Full-time Service and Type of Health Jurisdiction

Years of Service	All Health Officers		State		County		City		Mixed Jurisdictions	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1-2	912	38.2	33	26.0	415	42.9	426	43.4	38	12.3
3-4	533	22.4	34	26.7	230	23.8	209	21.3	60	19.5
5-8	516	21.6	32	25.2	229	23.7	159	16.2	96	31.2
9-14	288	12.1	17	13.4	73	7.5	117	11.9	81	26.3
15 and over	135	5.7	11	8.7	20	2.1	71	7.2	33	10.7
Total	2,384	100.0	127	100.0	967	100.0	982	100.0	302	100.0

nificant proportion of counties is a rather recent innovation; cities seem to have been slow in changing from part- to full-time service, while the position of state health officer has in most instances been on a full-time basis for a number of years.

When health officers as incumbents in jurisdictions of different governmental types are distributed according to years of employment (Table VI), one finds an unusually high proportion of city and county incumbents that served 1 or 2 years. If appraised on this criterion, state health officers do much better; yet one-fourth of them fail to serve more than 2 years. On using 5 years as a critical point it was found that the percentages of health officers by type of jurisdiction who served 5 years or more are as follows: states 47, counties 33, cities 35. Only 12 per cent of the health officers who shift from one type of jurisdiction to another serve less than 3 years, while 68 per cent serve more than 4 years.

Within their respective categories health jurisdictions behave differently in the security accorded to those who occupy the position of health officer. In some places there is little turn-over among the incumbents, while in others a change of health officers is made every few years. An analysis of the behavior of jurisdictions as expressed by their employment policy is not within

the scope of this study, *Ohio* possession, however, show very clearly that jurisdictions are essentially individualistic in this respect. It would seem that traditions of government, coupled perhaps with chance, influence the treatment of health officers much more than any clear-cut employment policy.

SUMMARY

Data presented in the foregoing article substantiate in considerable measure the prevailing impression that full-time health officers as a class pursue this type of work for relatively short periods of time. A generalization which expresses average experience, however, cannot be applied to all health officers. There is an unstable group constituting about 40 per cent of the total who are discontinued as full-time employees within 2 years from their first listing in the directories. After this critical period is passed the performance of those who remain is very much better. Particularly significant is the point that nearly 40 per cent of health officers had 5 or more years of full-time service while 18 per cent remained in office for 9 years or more. A very large proportion of the longer term health officers were on duty at the close of the study period, hence have the opportunity for improving still further their employment record.

Longer periods of service are reported for health officers who accept positions in two or more jurisdictions than for those who complete their experience where first employed. Neither personal factors such as age and technical training, nor geographic location of the health jurisdiction seemed to affect in any great measure the period of employment. State health officers presented somewhat better records than

did those of other jurisdictions, but this performance is probably due to the fact that states preceded both cities and counties in establishing a high proportion of full-time positions.

Taken as a whole the outlook for reasonable tenure of position for full-time health officers is not all that may be desired; yet the situation is much better than it is commonly alleged to be.

Population Growth—Its Vital Statistics and Public Health Aspects*

WARREN S. THOMPSON

Scripps Foundation, Miami University, Oxford, Ohio

THE facts regarding the present growth of population in the United States are too well known to this group to need much elaboration here. The birth rate has been declining for a number of decades, but as long as the death rate declined almost as fast—in fact at times even faster—the slackening of the birth rate did not attract a great deal of attention because the rate of natural increase was not greatly affected. Then, too, except for relatively short periods at different times, the large inflow of the foreign born added materially to our increase decade by decade, both because of the net gain through immigration itself and because of the relatively high birth rates of these foreign born. Furthermore, it is not unlikely that the very size of our decennial increase in numbers since 1900—13 to 17 millions—led us to overlook the fact that the rate of natural increase was declining rather rapidly.

In any event, within a little more than a decade there has been a marked enhancement of interest in the natural increase of our population and a growing realization that changes of far-

reaching significance are taking place. It is common knowledge today that even though there is still a considerable excess of births over deaths (800,000 to 900,000) each year, this excess persists only by virtue of the favorable age composition which is a heritage of the large natural increase of the not distant past. Because we had an increasing number of births each year until 1921–1925, we will have more persons in the child-bearing ages for some years yet than we had in the past, so that even with declining specific rates the total number of births will remain higher than the number of deaths for perhaps two decades. This same age make-up is also favorable to a low death rate and a relatively small total number of deaths. When, however, this favorable age make-up has passed, the crude birth rate will decline significantly even though specific birth rates should remain as they now are, and crude death rates will rise until they approach or even surpass those of a life table population. With specific rates for both births and deaths as they are now, we will have an actual excess of deaths over births and a declining population within about three decades. Further decline in specific birth rates will, of course, hasten the approach of the time when deaths will exceed births.

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

It is to be expected that death rates will decline somewhat in the future; but even if the expectation of life should rise to 70 years, which is 8 or 9 years higher than it now is, the death rate of a life table population would be 14.3 per 1,000, which is about 30 per cent above the present crude rate and only about one-sixth below the present crude birth rate.

From the standpoint of our interest here, it is the age changes which are taking place as our population growth declines that are of primary importance. The Scripps Foundation has calculated what our future age composition will be, if specific birth rates and death rates decline certain given amounts in the future, and if there is no appreciable immigration. It will not be possible here to do more than cite the main changes which would take place on the basis of what we regard as the most probable movements in vital rates.

The one thing that is reasonably certain is that the age changes indicated will not be exactly realized. On the other hand, it seems reasonably certain that the proportions of the population actually in the different age groups will not depart so greatly from these calculations that general conclusions derived from them will be useless.

In 1930 the persons under 20 constituted 39.2 per cent of our total population; by 1960, only 22 years hence, they will make up only 29.3 per cent. This is a decline of almost one-fourth. The group in the childbearing ages (20-44), on the other hand, will change but little during this period—from 38.1 per cent in 1930 to 37.4 per cent in 1960. The proportion at the ages 35-44 will, however, increase while that of the younger ages, when women are most fertile, will decrease. Thus the 35-44 group will increase from 13.9 per cent of the total population in 1930 to 15.4 per cent in 1960, while

those 20-29 will decrease from 16.8 per cent in 1930 to 14.3 per cent in 1960. This change in the age of the childbearing population is even more striking if we consider only the women 20-44. In 1930 the women 20-29 constituted 44.8 per cent of all women 20-44, but by 1960 they will constitute only 38.0 per cent of this group. On the other hand, the women 35-44 will increase from 35.7 per cent in 1930 to 41.5 per cent in 1960. Clearly, with the same specific birth rates in 1960 as in 1930, there will be a marked decline in the crude birth rates. There will also be a marked decline in the total number of births. This is the most important effect of the foreseeable changes in the age make-up of the group 20-44.

The increase in the proportion of the population at ages over 45 is of special interest because of its effects on the general death rate and because of the changes in public health work needed to adapt it to serve these older groups adequately. In 1930, the middle-aged—45 to 64—constituted 17.4 per cent of our people; in 1960 they will make up 23.3 per cent. The numerical increase in this age group between 1930 and 1960 will be about three-fifths while the total population will increase by only one-fifth. It is in the group 65 and over, however, that the most striking increase will take place. In 1930 this group constituted only 5.4 per cent of our total population, but in 1960 it will constitute 10.0 per cent. In actual numbers it will increase from about 6.5 millions to about 14.5 millions.

It would indeed be carrying coals to Newcastle to dwell at any length upon the effects of such age changes on the general death rate. Only a very great drop in the death rates at the older ages can prevent a rise of 40 per cent or more in the present crude rate, *i.e.*, a rise from the present rate of about 11 to 15 or 16 as our actual age com-

position approaches that of a life table population.*

Perhaps it will assist us to appreciate the public health problems involved in attempting to keep the general death rate from rising more than 25 or 30 per cent above the present level if we will study the changes in the expectation of life as shown in the life tables of some of the more progressive countries during the last century. These life tables without exception show a large and gratifying rise in the expectation of life at time of birth. In the United States, we can get a pretty good notion of the changes in the expectation of life in the period since 1789 if we use the life tables for Massachusetts.

In 1789 in Massachusetts a new-born boy had an expectation of life of 34.5 years. This rose rather slowly for about a century, and in 1890 was 42.5 years. From then on it rose rapidly and in 1930 was about 59 years. At age 20, on the other hand, the increase in expectation of life during this 140 year period was only about 11 or 12 years, and most of this apparently took place before 1890, although since 1900 about 4 years have been added to the expectation of life of males aged 20. This may be compared with the 12 or 13 years that have been added to that of new-born boys since the latter date. At age 40 the expectation of life of males has changed only from 25.2 years in 1789 to 29.0 in 1930—a gain of only a little over 3 years. At age 60 there

has not only been no gain, but there has actually been a slight decrease—from 14.8 to 14.3.

In England and Wales there has been much the same change although the period for which data are available is not so long. In 1838–1854 the expectation of life of boys at birth was 39.9 and this rose to 58.7 in 1930–1932. At age 20 the figures are 39.5 and 46.8 respectively; at age 40 they are 26.1 and 29.6, and at age 60 they are 13.5 and 14.4.

In the Scandinavian countries, the pattern of change is the same as in the United States and England, but at the older ages, the expectation of life has improved more than in most other lands—for example, in Sweden it rose from 12.1 years for males at age 60 in 1816–1840 to 16.5 years in 1926–1930.

In New Zealand, where the expectation of life is the highest of any country in the world, the increase for males between 1896–1903 and 1931 was 10.6 years at birth but only 1.3 years at age 60. Thus it appears that there has been only a relatively small increase in the expectation of life at ages of 40 and over even when we can go back a century or more, while there has been a very large increase at birth and up to age 20.

These facts show beyond doubt that all the great advances in medicine and in public health work during the last century have had but small effect in prolonging the life of the mature adult. They have, however, done much for the new-born infant and for young children.

It is possible that the very success of health work in saving the lives of infants and children is one of the reasons it has not accomplished more for the adult. It may be that the survivors to adulthood today are not, on the average, as tough, not as resistant to organic ailments, as the survivors in a population having more rigorous selection at the younger ages. So far as

* It should be pointed out that the only figure of much doubt in the above calculations is that for persons under 20. These persons are not yet born and the birth rates used in calculating their numbers may vary more or less from those actually realized. I may say that the birth rates used here seem likely to give a larger number of births than the actual rather than the reverse. As for the other ages, all persons who will be over 22 in 1960 are already born. There may be large fluctuations in the death rates from which survivors are calculated, but since this is not very likely, we can be reasonably sure of the numbers at these ages. The proportions at the different ages would of course be affected by a larger or smaller number of births than that calculated.

I can see there is no means of testing the validity of such a hypothesis because one cannot tell who among those now 40 or over would have survived under the health conditions prevailing a century ago. However, the most important reason for the failure to effect any considerable increase in the expectation of life of the mature adult undoubtedly lies in the difference in the nature of the ailments to which children and adults are subject. Children are subject to germ diseases rather than to organic diseases. Their organs have not had time to go astray or to fail in their proper functioning, but the introduction of alien organisms—germs—catches their bodies unaware, so to speak, and easily overcomes their feeble resistance. Hence the development of sanitary living conditions and the protection against a few of the more virulent germ diseases have wrought wonders in reducing infant and child mortality.

But these measures do not suffice to prolong to anything like the same extent the lives of those who have survived childhood. The body apparently builds up a certain amount of resistance to these germ diseases if it survives their early attacks, but this does not in any way insure against the wearing out of our vital organs. There is a limit beyond which our bodies cannot be kept in good working order. There is little reason to think that we have already reached this limit in the United States since in New Zealand and in Sweden the expectation of life at age 40 was about 3 years greater in 1931 than it was in the United States, and at age 60 was about 1.5 years greater.

Due to the differences in the types of diseases which cause death among infants and children and older people, the improvement of the expectation of life among the latter will probably be much more difficult. The category of diseases labeled infectious and para-

sitic cause, about one-sixth of all the deaths of children under 5 years of age but only about one-twenty-fourth of the deaths in the slightly smaller group of persons 60 and over. On the other hand, cancers and other tumors are negligible as causes of death among children under 5, but account for nearly 13 per cent of all deaths among people over 60. Diseases of the circulatory system are also of small moment among children but cause almost 40 per cent of all deaths at over 60 years of age. Diseases of the nervous system also take a heavy toll among old people but are of little moment among children. Diseases of the respiratory system and of the digestive system take a heavy toll among both young and old but especially among the young.

This very brief statement shows clearly that in general the diseases which account for a large part of the deaths among the older people are those arising from or associated with the wearing out of the vital organs. In the very nature of the case these diseases have no such uniform and simple causes as have typhoid, diphtheria, enteritis, measles, etc. Sanitation, care to avoid exposure, and antitoxin inoculation will not ward off many of the diseases of later middle age and old age. Their causes are far more complicated than the causes of diseases which claim the lives of infants and children. Also they are probably highly individual so that treatment that will prevent heart ailment in one person may not prevent it in another. Then, too, social conditions very difficult of amelioration probably more often lie at the root of organic diseases than of the more acute infectious diseases. Thus the conditions of one's living and of one's work, which are very intimately bound up with the entire social and economic structure, may be the underlying causes of the breakdown of the heart, the kidneys, the liver, or the develop-

ment of nervous troubles rather than any specific bodily condition or infection. It is very difficult, indeed it is almost impossible in most cases, to establish any demonstrable nexus between the immediate cause of death and the conditions of life which may have induced this particular ailment. Furthermore, even when it is known that a particular organic disease is likely to result from a given manner of life, this knowledge does not throw any significant light on how to apply effective means of prevention in this and similar cases since it may be quite impossible for the victim to comply with the conditions essential to his health because of economic or social conditions over which neither he nor his physician has any appreciable control.

Only a much more extended community control over economic and social conditions than we now have, coupled with an enlarged and more adequately organized public health service, can make available to everyone the full benefits of our growing medical knowledge. But since these organic ailments do not seem to endanger the entire community like a contaminated water supply or the spread of smallpox and diphtheria, they are not now generally considered matters of public concern except by a small minority of those practising medicine and a few persons whose work leads them to appreciate the difficulties the average person has in securing adequate health service. I venture to predict, however, that there will be a very rapid extension of public health work within the next two or three decades and that the diseases of later middle life and old age will receive a much larger share of attention in the future than in the past. But we should not expect too much in the way of prolonged life from better health service. The human organism has its limits and must wear out. What we may expect is that life will be made

more comfortable and more pleasant for older people by keeping them in reasonably good health until near the end of life.

By way of summary I would again call attention to two points which stand out clearly from a study of present-day death rates and the trends in mortality: (a) there is need of a greater concentration on the study of organic diseases in the medical schools and research organizations than in the past, and (b) it seems highly probable that medical men will have to join forces with sociologists, economists, and the government much more than in the past if they are to search out all the causes of the ailments of adults and find the means for their prevention and cure—for example, even more than in the prevention of infectious diseases, it may be necessary to exercise control over the general conditions of life if organic ailments are to be prevented from taking an unnecessary toll.

As officials interested in public health work, you have never believed that health was solely or even primarily a private matter which could be left to physician and patient. You are fully aware that securing a sanitary water supply is quite beyond the means of an individual in any densely settled community. Just so it seems that taking care of organic troubles is very frequently beyond the power of physician and patient alone. The community must provide the social and economic conditions in which physician and patient can coöperate effectively. In other words, public health organization must be extended into new fields to bring the full benefits of medical discovery into play for our aging population, just as it was necessary to create an effective public health service in the past century to apply the knowledge of medicine and sanitation which had been accumulating but which could not become effective in reducing human misery

until it was organized by the community. If such an extension of public health service as is envisaged here is objected to on the ground that it encroaches on the freedom of medical practice and the right of the individual to determine what he will do with his own health, the answer is that long ago the community determined that no one had a right to spread smallpox or diphtheria or certain other diseases; indeed in some communities one has no right to have these diseases at all but must be immunized against them. Today we are on the verge of saying, as they have already done in Sweden, that no one has a right to have venereal disease and certainly no one has a right to marry and have children as long as there is danger of transmission. Tomorrow we may come to prize more highly the right to proper medical examination and diagnosis looking to the prevention and early cure of organic ailments than the right to have circulatory troubles, nephritis, or diabetes if we want to.

If the extension of public health service to the point where everyone has adequate health service curtails freedom in certain respects it will, on the other hand, create a far more valuable freedom, namely, the freedom from crippling and lethal organic ailments in an increasing portion of our population, and this surely is a consummation devoutly to be wished for.

Every great advance in human welfare has been regarded as revolutionary by those whose interests were adversely affected, but once the step has been taken and the benefit realized, future generations wonder why their forebears were so stupid as not to have done it sooner. So it will be with the extension of public health service and the economic changes necessary to make advancing medical knowledge fully effective for human welfare. But such an extension of health service will come and it will be organized to care for the older part of our population much more adequately than in the past.

Practical Experience with the Scharer Rapid Field Test for Pasteurization*

D. M. ROGER

Borden's Farm Products, New York, N. Y.

THE efforts expended by workers in Public Health and commercial dairy laboratories in the control of the pasteurization of dairy products together with recent improvements in equipment and effective Board of Health regulations have considerably increased the efficiency of pasteurization. Unfortunately frailties, human and mechanical, still exist causing the slight inefficiencies in pasteurization that would be almost impossible to detect had the phosphatase test not been developed.

As is generally known by workers in this field, the enzyme phosphatase which is present in mixed supplies of cows' milk, has the ability to hydrolyze disodium phenyl phosphate liberating free phenol, a quantitative determination of the phenol liberated being a measure of the activity of the enzyme. When milk is held at pasteurizing temperatures phosphatase is almost completely inactivated by the end of the holding period. It has been demonstrated by Kay and Graham³ and others²⁻⁷ that a measurement of the phosphatase activity of pasteurized milk is an index of the efficiency of pasteurization.

Gilcreas and Davis² in their investigation of the Kay and Graham test not only demonstrated the value of the

test but also awoke a nation-wide interest in the subject. While the Kay and Graham method is suitable for use in a well equipped laboratory it does not lend itself to routine plant control and field work.

The ideal test for plant control must embody simplicity, rapidity, and reasonable accuracy. For plant control it is not necessary to measure the exact degree of under-pasteurization—it is sufficient to know if a sample will or will not pass as being efficiently pasteurized.

Fortunately for those of us employed in the control of pasteurization plants, Scharer⁴ of the New York City Department of Health has developed two modifications of the Kay and Graham test, one for laboratory work involving an incubation period of 1 hour and the other a rapid field test requiring only 10 minutes' incubation. The reagents for this rapid test may be made up according to directions given by Scharer⁵ or they may be purchased on the market in tablet form, which is very convenient for control and field work.

EXPERIENCE WITH THE TEST IN PLANT CONTROL

About a year ago it became evident that the best method of controlling pasteurization by means of the phosphatase test was to equip each plant so that the milk could be tested at

* Read at a Joint Session of the Laboratory, Public Health Engineering and Food and Nutrition Sections of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October, 28, 1938.

regular intervals during the run. The Scharer Field Test filled most of the requirements previously mentioned and preliminary tests indicated that it would detect at least 0.5 per cent added raw mixed milk. Knowing that this test was new and not fully tried out we installed it in 14 pasteurizing plants and awaited further developments. During the past year, in these plants and the laboratory, we have performed more than 18,000 tests by this method or a slight modification of it. While these findings have not the same value that tests on samples pasteurized under laboratory conditions would, certain observations may be made:

1. No cases were encountered where interfering substances in the milk itself gave false positive tests.
2. Duplicate tests checked accurately where reasonable care was observed.
3. It has been possible to detect the addition of 0.1 per cent of raw mixed milk to milk pasteurized commercially at 143° F. Such tests were made frequently to check the reagents. (In plant work we have always used a 30 minute incubation period for the test.)
4. When samples from these plants were run side by side in the laboratory and one or two plants consistently gave higher readings than the others it seemed safe to assume that unless there were interfering substances in the milk, this was an indication of some fault in the pasteurizing process rather than an error in the test. Follow-up inspections of these plants have usually revealed the reason for these higher tests, but the intermittent occurrence of only slightly abnormal tests is not so easily explained, but if these intermittent tests are confined to one plant it is again safe to assume that the pasteurizing is at fault and not the test.
5. If accurate work is to be done the precautions given by Scharer⁵ regarding the storage, preparation and checking of the reagents must be strictly adhered to.

SOME CAUSES OF FALSE AND ERRATIC TESTS ENCOUNTERED

Scharer has listed certain causes for false tests in his article.⁵

The most common causes of false positive tests that we encountered were:

1. The equipment used for sampling had been contaminated with raw milk.
2. The tablets used for preparing the test solutions were too old or had not been kept under refrigeration.
3. The test equipment had not been properly cleaned.

Some less common causes were:

1. One case was found where someone had dipped a pipette contaminated with raw milk, into the bottle of distilled water used for making up the substrate.
2. Some reagent bottle closures have been encountered that liberated phenol.
3. In another case someone had contaminated the distilled water, with sulphuric acid from a storage battery hydrometer. While this did not cause a positive test it did interfere by retarding the development of the indophenol blue.

Some causes of erratic tests:

1. Insufficient mixing of the milk with the substrate at the start of the test.
2. Insufficient shaking after the B. Q. C. indicator has been added.
3. Not waiting full 5 minutes after the B. Q. C. indicator has been added.
4. Insufficient shaking when extracting with the butyl alcohol.

Most of the work that we have done has involved the use of amyl alcohol* (boiling range 126—132° C.) as a solvent in place of normal butyl alcohol. While the amyl alcohol does not extract quite so much of the indophenol blue it has the advantage of not extracting so much of the yellow color from high color milk and cream. This yellow color does interfere with tests on slightly under-pasteurized products. However, for most practical purposes butyl alcohol is satisfactory.

Since many of our plant testers work by artificial light it is important to develop a distinct color contrast between a pasteurized milk test and a test on a sample that is slightly under-pasteur-

* Different color standards are required when amyl alcohol is used.

ized. To accomplish this we have equipped our plants with small water bath incubators and have increased the time of incubation from 10 to 30 minutes. Table I indicates the color gain achieved by this increased incubation.

TABLE I

Holding Time and Temperature		Incubation	
Minutes	Degrees F.	10 Minutes	30 Minutes
25	142	B	B
30	142	5+	5++
35	142	2+	5+
25	143	2+	5+
30	143	2—	2—
35	143	2—	2—

The color standards used are those described by Scharer.⁵ Normal butyl alcohol was used for extraction.
B indicates that a blue color was easily detected without extraction. (With experience one is able to pick out even smaller discrepancies without the alcoholic extraction.)

It will be noted in Table I that, fortunately, pasteurized samples show little increase in color due to increased incubation but slightly under-pasteurized samples show considerable gain.
Table II shows the results of tests on some samples of "B" Raw milk pasteurized under laboratory conditions.

TABLE II

Time of Holding	Temperature of Holding $\pm 0.2^{\circ}$ F.				
Minutes	141° F.	142° F.	143° F.	144° F.	145° F.
20	B	B	B	5	2—
25	B	B	5+	2	2—
30	B	5++	2—	2—	2—
35	B	5+	2—	2—	2—
40	B	5	2—	2—	2—

These samples were incubated 30 minutes at 37° C. The same color standards were used as in Table I. Normal butyl alcohol was used for extraction.
Table III indicates that there is little or no benefit to be gained by incubating 30 minutes at 47° C. instead of 37° C. In our plant control work we incubate our samples in small insulated water baths which are filled with water at

44° C. at the end of 30 minutes the temperature is still above 37° C. Table III indicates that this range of temperature should not interfere with the test.

TABLE III

A Comparison of Duplicate Tests Incubated at 37° and 47° C. for 30 Minutes

Sample	Reading After 30 Mins. Incubation			
	At 37° C.		At 47° C.	
1	2	2	2	2
2	2—	2—	2—	2—
3	5	5	5	5
4	5+	5+	5+	5+
5	2	2	2+	2+

Normal butyl alcohol was used for extraction and Scharer⁵ color standards were used to obtain the readings in this table.

SUMMARY

A year's experience with the Scharer Rapid Field Test has shown that this method is simple, and when performed with care its accuracy closely approaches that of the longer laboratory tests.
A 30 minute incubation period was found to aid in the detection of slightly under-pasteurized samples.
When this test is used as a routine control the milk and cream can be checked before leaving the plant.

REFERENCES

1. Gibbs, H. D. Phenol Tests III. The Indophenol Test. *J. Biol. Chem.*, 72:649, 1927.
2. Gilcreas, F. W., and Davis, W. S. The Practical Value of the Phosphatase Test in Determining the Efficiency of Pasteurization. *Ann. Proc. I.A.M.D.*, 34-56, 1937.
3. Kay, H. D., and Graham, W. B. The Phosphatase Test for Pasteurized Milk. *J. Dairy Res.*, 6, 191-203, 1935.
4. Scharer, H. A Rapid Phosphomonoesterase Test for Control of Dairy Pasteurization. *J. Dairy Sci.*, XXI, 1:21-34, 1938.
5. Scharer, H. Improvements in the Rapid Phosphatase Test for the Detection of Improper Pasteurization of Milk and Its Products. *J. Milk Tech.*, 1, 3:35-38, 1938.
6. Storrs, A. B., and Burgwald, L. H. The Phosphatase Test. *J. Milk Tech.*, 1, 2:18-35, 1938.
7. Tracy, P. H., and Hahn, A. J. Determining the Efficiency of Milk Pasteurization. *Ann. Proc. I.A.M.D. Lab. Section*, 57-71, 1937.

Health Maintenance in Industry*

CLARENCE D. SELBY, M.D., F.A.P.H.A.

Medical Consultant, General Motors Corporation, Detroit, Mich.

THE workman in industry is employed about 25 per cent of his time. It is only in this respect and to that extent that his life differs from that which is common to his community and the position he occupies in it. The causes of sickness and injury may originate at any time during the 24 hour cycle of each day. Some are definitely occupational, some are definitely non-occupational, and in some, the origin may be doubtful.

The definitely occupational are responsible for about 6 per cent of the workman's total annual disability from sickness and injury. In other words, 25 per cent of his time, or his occupation, accounts for only 6 per cent of his annual disablement. This clearly places the major problem of maintaining employee health in the employee himself and his community rather than in the plant, and it immediately brings up the question—What can the plant physician do about it?

He can do this. He already has a well organized health maintenance program which experience is proving to be effective in so far as the occupational disablements are concerned. He can extend this program to include studies of non-occupational sickness. He can act as a case finding agency for the local private physicians who care for the workman, and he can act as an aid to the local health officer.

It is doubtless unnecessary to discuss the plant physician's health maintenance program which is now fairly well established and rather well known, but as a basis for consideration of these newer responsibilities, it should at least be outlined.

OCCUPATIONAL DISABLEMENTS

The treatment of industrial injuries and occupational diseases is assumed in any industrial medical program. Every well organized plant medical service has ample provisions for that. It can be said, however, that the modern plant physician is coming to depend more and more upon specialists for services of that nature. He is himself a specialist in a field which is gradually merging into preventive medicine, and he recognizes the value of specialized attention in the treatment of injuries and uses it.

Unfortunately this is the only service that the employees of about 85 per cent of the industrial establishments of the United States receive and it involves about 60 per cent of the employed population. To render adequate service, comparable with the best practices of industrial medicine, to this group, is a problem of the private practitioner in medicine who serves industry on-call or on a part-time basis, and its solution lies in their training for industrial practice.

In connection with the handling of the occupational disabilities, the plant doctor is occasionally faced with the necessity of passing upon the validity

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

of claims for compensation. His decisions, whether large or small amounts are involved, are always important because of their possible influence upon employee relations. He must not, however, be influenced by this fact or by the fact that he is employed by the management. A partisan plant doctor cannot for long hold the confidence of either management or the employee group.

The treatment of occupational disabilities is still a major function of industrial medicine, and in many places it is the dominant function. If partisanship is pursued to the point where the doctor becomes known for his bias, he is seldom competent to protect either his company or the health of the workmen. An effective health maintenance program in particular is built up on confidence. The plant physician is always on sound ground when he gives his employee patients the consideration he would if they were private patients, and in this all they ask is that he be fair.

With the exception of the treatment of occupational disabilities, all functions of industrial medicine point up toward health maintenance. A logical beginning is in studies of the working environment.

ENVIRONMENT

Theoretically a physician is able to determine the effects of environment upon health, but practically only those can do so who are familiar with the plants in which they serve, and then only by studies of the various operations and workroom environments, by special examinations of the workmen, and the coordination of all findings. This is a task of magnitude, especially with regard to studies out in the plant.

To assist him in these, the doctor now has a valuable ally in the industrial hygienist. Ability to interpret his findings is essential and capacity to obtain

corrective measures is desirable. Otherwise the doctor may fail in the correlation of physical findings in the employees with conditions in the plant and the correction of conditions that prove to be harmful. Industrial hygiene properly belongs in the medical department.

SAFE PLACEMENT

Having become familiar with working environments and conditions, the doctor is able to advise in the safe placement of new workmen. In order that new workmen may be assigned to occupations for which they are suited and can safely perform, a knowledge of their physical conditions is necessary. To obtain this knowledge is the purpose of the preemployment examination. Certainly it must be sufficiently thorough to enable the doctor to advise intelligently as to placement. As this is only the beginning of the workman's plant life, the examination must also serve as a source of information to guide the doctor in his subsequent efforts in behalf of the workman's health and his continuing safe employment.

The examination should be a reasonably complete physical study, supplemented by roentgenograms of the lungs and such other procedures and tests as the doctor considers to be essential. This examination is the doctor's introduction to the workman. If he impresses him as being an able physician, honestly interested in employee health, he has gone far toward building up the employee's confidence and good will, which are so necessary to health maintenance. A doctor cannot well serve an employee who has little or no confidence in him.

PHYSICAL SUPERVISION

Important though it is, the preemployment examination must always be considered as a preliminary in the plant physician's subsequent physical

supervision of the employee. It brings out information which he needs for comparison with the findings obtained by periodical examinations.

These periodical examinations are to secure early diagnosis of preventable diseases and adjustments in occupation if necessary. They are essential to the control of occupational diseases. They should be as complete as the doctor requires for a conclusion, and they should be made often enough to give the workman health protection, but not less frequently than annually.

A workman being transferred from one department to another should receive such examinations as may be necessary to safe placement in the department to which he is being transferred.

Reëntrance examinations should be made after absence from illness or injury. They are to protect workmen against a too early return to usual work or to effect changes in occupation if indicated. These need not be more extensive than in the judgment of the physician is required to safeguard the workman and the employer.

It is only natural that the workmen consult the doctor from time to time about personal matters and, although he will not attempt to treat them, for that properly belongs in the field of private practice, he will take advantage of the opportunity to consult and advise. In order to do this, it is essential that an examination be made. This examination is such as any doctor might make for diagnosis and counsel.

HEALTH INSTRUCTION

The best of health instruction is that which follows physical examinations or accompanies consultations. This is personalized instruction and as such is very effective. Every visit of every employee to the medical department, and these frequently equal 100 per cent of the total number of the employees

monthly, makes an opportunity for health instruction.

RECORDS

These should show the results of all physical examinations and consultations and will include particularly detailed reports on injuries and illness, descriptions of physical findings, treatments, estimated periods of disability, end results, and all other information pertinent to cases or required by statute for Workmen's Compensation claims or other purposes. In short, records should be sufficiently complete to permit the making of statistical studies.

CASE FINDING

In the course of preëmployment and periodical examinations and in connection with consultations, the physician will discover conditions that require treatment. This case finding function of industrial medicine has far reaching consequences in the field of health maintenance. It is very apt to uncover and encourage treatment of a great variety of pathological conditions and diseases which, under ordinary circumstances, will not receive attention until farther advanced.

Needless to say, employees found to be suffering with correctable conditions are referred to their family physicians. This phase of industrial medicine serves as an important agency for the general profession and the public health authorities. This is particularly true with reference to tuberculosis, syphilis, the cardiorenal diseases, vascular diseases, and many others which need not be mentioned.

STUDIES OF SICKNESS

It is seen from the foregoing that the plant physician has a splendid opportunity to accumulate data relative to the instance of non-occupational sickness and injuries as well as the occupational. Although not a responsi-

bility of industry, their prevention and control is preëminently desirable. As a means toward this end, the plant physician collects and analyzes statistics concerning sickness relating to occupation, sex, age, and other facts that may involve, or be involved, in the health of the workmen.

At the moment, industry, generally speaking, has little or no knowledge of the losses which accrue to the employees because of non-occupational sickness nor have they any knowledge as to the losses which accrue to industry. Statistical studies will divulge this knowledge, will enable industry to contribute its share toward a disease prevention program, and will serve as a basis for the definition of the responsibility of the general medical profession, public health authorities, and the community, in relation to employee health.

COÖPERATION WITH THE MEDICAL PROFESSION

By this time it has become apparent that the plant physician is dependent, to a large degree, upon the local medical profession, and that the local profession is, in reality, an element in the plant medical service. It is desirable, therefore, that the industrial physician make it clear to the local profession that although he is in a sense an uninvited consultant, he is at the same time a very valuable ally. He should attend medical meetings, mingle with the local hospital groups, and take a place in local medical circles appropriate to the position which he occupies and commensurate with his opportunities for service, not only to industry but to the community itself. He must never assume the rôle of the private physician.

COÖPERATION WITH OFFICIAL AND NON-OFFICIAL AGENCIES

Industrial medicine is coming to realize more than ever before its opportunities for service in the public health field.

It is the only organized point for attack against the preventable diseases in the employed group, which is, in reality, a definite age group. Industrial medicine may serve in the public health field for this group in a manner much as has already been done in relation to infants, children, and adolescents. This opportunity becomes increasingly evident as the control programs for tuberculosis and syphilis develop.

Plant studies of non-occupational sickness are obviously supplemental to the community studies of sickness, the so-called vital statistics, and epidemiological studies in the plants, a brilliant conception of J. J. Bloomfield, have the same import with respect to the health of the employed group as epidemiological studies of the community itself.

Details as to methods for coöperation with municipal and state health departments and nonofficial agencies are not needed. All physicians are familiar with the routines. It should, however, be made clear to these departments and agencies that in industry is a valuable ally in promotion of community health.

CONCLUSIONS

By virtue of his place in industry, his responsibilities, facilities, and contacts, the industrial physician is able to contribute substantially to the health of his community, and in so doing is able to further very considerably his own health maintenance program. In addition to the now accepted procedures of environmental plant studies, preëmployment and periodic examinations, consultations, and health instructions, he sees even greater possibilities in extensions into the broad field of public health by statistical studies of non-occupational sicknesses in the employed population, epidemiological studies of those groups that show a high incidence of disease, and a well coördinated plan of coöperation with medical and public health agencies.

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

November, 1938

Number 11

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

PATENT MEDICINES AND ADVERTISERS

THE nostrum evil flourishes in most parts of the world. The Scandinavian countries, Czechoslovakia, Switzerland, and a few others are better protected in this regard than the United States, Great Britain, France, and many South American countries.

The fight against patent medicines has been a long and sickening one in this country, and only recently have we succeeded in getting a law passed which has raised expectations for better things. It is too much to hope that the fight is over and that the victory is complete or permanent.

Reports from England indicate that the trade in quack medicines has been growing enormously, so much so that Lord Horder has been led to take up the matter in the House of Lords. He has pointed out in a masterly way the evils of the business and the inconsistency of allowing it to grow and flourish at a time when the government is making nation-wide efforts to improve the national fitness. It is stated that in England the patent medicine trade takes from the public between 125 and 150 million dollars a year, which is about the same amount as spent on hospital services. This money comes largely from that part of the public which can least afford it. Where the government spends \$500 for health for the public, the patent medicine industry pays \$5,000 to make them disease conscious. For the medicines recommended for nervous and digestive disorders alone approximately 5 million dollars will be spent in advertisements during the coming year. Lord Horder pointed out that when he proposed to take up the fight against the patent medicine evil he was warned that he would arouse against him the great advertising interests and would have to fight the proprietors of the newspapers. It was evident in England, as in this country, that the advertising interest is the chief obstacle to be overcome in any attempt to improve matters. Efforts to improve the laws regarding foods and drugs have always been met by a well organized lobby of advertisers, supported by highly paid legal lights. Practically all that he said is an old story in this country, where it is said that the national advertising expenses amount to about a billion and a half dollars a year, of which newspapers get approximately 700 million, mail advertising 400 million, magazines 210 million, and billboards 75 million, press and trade papers about the same amount, in addition to which are

the radio, premiums, special programs, street car cards, etc.¹ At least five patent medicine concerns have each paid more than a million dollars a year for newspaper advertising. In 1933, twelve corporations spent more than a million each for magazine advertising and the total cost of magazine advertising for 150 corporations was \$93,987,970 for the year 1933.¹ In England, as in this country, advertising is a specialized profession. The manufacturers of a nostrum hand their material over to a specialist who plans the campaign and places the advertisements. Lord Horder believes that the advertisements have become a greater danger even than the remedies since they play on the fears of people, and the healthy as well as the sick are swindled.

In England, as here, while some proprietary remedies are fairly good in themselves and the claims made for them fairly reasonable, not infrequently preparations are sold that do definite harm. This applies not only to medicines for internal use but also to those for external application, and especially to cosmetics. Our recent experience in this country with the Elixir of sulphanilamide is an example of what has been possible here, and seems to be possible in England now. The patent medicine interests and the advertising specialists are more quick to catch on to new ideas than the medical profession. No sooner is a discovery made and published than the advertising specialists take hold of it and exploit it. In England this is shown particularly by the change from advertisements of cancer and hernia cures to those directed against rheumatism, which is coincident with the many studies and great interest which that disease is now attracting in that country.

The radio has brought to us an entirely new problem and we have recently reviewed in these columns a book devoted to the abuses of radio advertising of patent medicines. The matter has very properly attracted considerable attention. The broadcasts reach an enormous audience. In 1935, the drug manufacturers spent \$15,986,507 on radio advertisements.² That they can afford to spend such vast sums shows the profits derived from the business.

A number of books have been written, chiefly by laymen, on the drug evil, and some by medical men. The Massachusetts Agricultural Experiment Station, *Bulletin 342*, has given one of the best expositions which have come to our attention. This *Bulletin* of 30 pages covers the subject in a masterly way and ends by giving a list of 10 articles and books which can well be studied. Other books, like *The Traffic in Health*, written by a physician, have appeared. The matter is one of the greatest interest and importance. The public health and medical professions owe it to the governmental agencies and to the public to give support to such laws as exist and to make every effort to aid in their efficient administration.

"We may be perfectly certain, as these lines are being read, that groups of shrewd men, here and there around our fair land, are busy sharpening their wits to try to find loopholes in the new Food, Drug, and Cosmetic Act that will let them continue to thimblorig, bamboozle, dupe, dope and poison innocent sufferers, and make millions out of it. Are these gentry going to reform and turn into plaster saints just because Congress has passed a law? Not unless human nature has had a total transmogrification."³

REFERENCES

1. Solomon, Charles, M.D. *Traffic in Health*.
2. Morell, Peter. *Poisons, Potions, Profits*.
3. *New York State J. Med.*, Sept. 1, 1938. p. 1201.

BOVINE TUBERCULOSIS IN CHILDREN

WE have commented before on the work being done on this subject at the University of Toronto under the National Research Council of Canada. Another report covering 13 years has been issued.¹

Toronto is a particularly good place in which to make such an investigation since the pasteurization of milk is compulsory and the laws have been rigidly enforced since 1915; hence we have the comparison between the children who live in Toronto and those brought in from the outside. Through private physicians and sanatoria a number of tuberculous children from the Province of Ontario have been seen.

In a series of 500 tuberculous children, in 9.6 per cent of extrapulmonary tuberculosis the bovine type was found to be the infecting organism. Bovine bacilli have been recovered from bones, joints, glands, kidneys, meninges, serous surfaces, tonsils, adenoid tissue, and skin. With the exception of primary tuberculosis of the lung it has been found that no organ or tissue of the human body is immune to infection with the bovine type of organism.

The children in whom the bovine tubercle bacillus was found have come to Toronto for treatment from Ontario, some other Provinces, and some other countries, in all of which the milk supply was not pasteurized. In every case it was found that the tuberculous children had been fed raw milk. In three instances it was possible to obtain a sample of the milk used and to study it by guinea pig inoculation, and in three cases the disease was actually traced to the responsible animal.

It is interesting to note that since 1926, when this investigation was begun, much progress has been made in Ontario in the control of bovine tuberculosis and its eradication. Among 850,000 animals tested, 12.8 per cent of those found to be reactors have been removed and pasteurization has been introduced into many municipalities, 50 having adopted compulsory pasteurization in 1938. In 75 others a large part of the market milk is pasteurized. The present report shows that the incidence of bovine tuberculosis in children has fallen from 13.5 per cent in 1935 to 9.6 per cent at present, which is attributed both to the control of cattle tuberculosis in Ontario and to the greater use of pasteurized milk. No better proof of the value of pasteurization could be given. It seems strange that any opposition still exists.

REFERENCE

1. *Canad. Pub. Health J.*, June, 1938, p. 251.

THE FEAR OF AIR RAIDS

IF there are any who do not realize how fortunate we are to be living in the United States in spite of all the many things which make us apprehensive and perhaps unhappy, even a casual perusal of the general feeling in England, for example, toward air raids will make us appreciate the advantage of life here over that abroad.

We have already called attention to the manufacture of some 45 million gas masks and the drills in their use which are carried out even down to school children. That this constant apprehension must have some decided effect on

character and health goes without saying, but there is another aspect which demands attention—in some ways a more practical one.

At the recent Portsmouth Health Congress, a conference on Air Raid Precautions was held under the Presidency of the Lord Mayor of Portsmouth.¹ The Lord Mayor, in his opening address, said it was a sad reflection that at a time when local authorities were engaged in increasing and improving the social services of the country they are forced to prepare to meet a menace from the air. The isolation and safety which Britishers have felt for hundreds of years, owing to their insular position, existed no longer and that at least the early part of the next war would be waged literally on their very door steps. In view of this, the government has placed upon the local authorities the duty of passive air defense. It was an entirely new departure for local authorities which raised many problems never thought of.

A series of set discussions by six officers of the City Council followed—the Town Clerk, the Medical Officer of Health, the Chief Constable, the City Engineer, the Engineer and Manager, Portsmouth Electricity Undertaking, and the Transport and Cleansing Superintendent, upon all of whom special duties and responsibilities would fall.

There has been issued a 76 page "Air Raid Precaution Handbook (Provisional)." In July, 1937, combined coast defense exercises were carried out by the three defense services, including a complete "blackout" of the Portsmouth naval area, and more extensive exercises took place in March, 1938.

More important to us is the public health aspect presented by Dr. A. B. Williamson, Medical Officer of Health. He said that the energies of health officers are already fully absorbed in expanding health services necessary to keep pace with the great amount of recent public health legislation, and yet a new responsibility had been placed upon them which certainly requires increased personnel and a greatly increased expenditure. Except for the wonderful invention of the Wright Brothers in America, this problem would not exist today, but it is here to stay and the Air Raid Precaution Casualty Service must be a permanent organization, as man will continue to increase the speed, range, and effectiveness of the plane as a weapon of war.

The layout of the modern health department is not unsuitable as a nucleus of a casualty service. The ordinary duties are militant, the organization built up to fight against an unseen enemy—disease germs. Sanitary inspectors, disinfecting staff, health visitors, and tuberculosis nurses may be termed advance troops attempting to destroy the enemy on the outskirts. They are now called upon to build up a casualty service for those who may become victims of another kind of enemy—airplanes. The casualty service has always played an important part in war. The precautions advised and now being taken would have a very important part in preserving the morale and building up confidence that casualties would be dealt with rapidly and efficiently. The Medical Officer of Health is the man who must be responsible for an efficient emergency service; consequently, an Air Raid Precaution Casualty Service Section should be created within the health department, and in large local authorities of strategic importance there should be a medical officer for air raid precautions with an office, the assistance of a whole time senior clerk and stenographic service.

In addition, there should be in every exposed city a large model first aid post, centrally located immediately available at the outbreak of hostilities. The plan and description of the one for Portsmouth, designed by the City Architect,

is given. Among other necessities is a "Mustard Laundry," in order to handle clothing which had come in contact with poisonous gases. This is better situated at the infectious disease hospital where laundries for infected clothing, which can be easily adapted to the new uses, are already located.

From the public health standpoint, perhaps equal in importance to the health officer is the city engineer, under whose care comes the maintenance of roads and communications, repairs and maintenance of sewers, sewage pumping stations, sewage disposal works, the protection of such buildings as schools, hospitals and institutions, shelters for the public, protection of gas, electrical, and water supplies, training of personnel, and rescue of persons from buildings damaged in a raid. Of course, all of these things require tools, plant and other equipment, including facilities for transport, special vehicles, etc. Precautions must be taken against high-explosive bombs, incendiary bombs and gas bombs. Indeed, it is impossible to enumerate here all the different responsibilities which must fall upon the engineer. In addition to the maintenance of the water supply, precautions must be taken for decontamination. Reservoirs which have been polluted during air raids must be cleansed and made fit. In Portsmouth, the City Council has already included 60,000 pounds (normally \$300,000) for 1938-1939 as a first installment for expenses of the Air Raid Precaution Program. Portsmouth is an important place and would perhaps be one of the first objects of an air raid by an enemy, but the program already under way there and the huge expenditure as the first installment will give an idea of how the people in the exposed parts of the British Isles are feeling.

As during all the years of our existence as a country, so now we should still feel thankful for the Atlantic Ocean which lies between us and the countries in which so much unrest and bitterness are evident. In spite of the prediction of what man will do with implements of war in increasing their destructiveness and range, we indulge the hope that we may never be called upon to take such precautions as England feels to be necessary, and never be under the mental strain which is so evident there and in other European countries.

REFERENCE

1. *J. Roy. San. Inst.*, Oct., 1938, p. 303.

AN UNUSUAL SUICIDE

CURIOUS and unusual methods of suicide are occasionally reported, but as far as we are aware the instance here recorded¹ is the only one brought about by the injection of virulent tubercle bacilli into the veins.

The subject was a medical man 29 years old who had a family history of tuberculosis and who had probably suffered himself from a pulmonary lesion. Two days after the injection, fever began and persisted until his death at the end of 3 months. Nine days after the injection a radiograph showed normal lung fields, but one taken 23 days later gave a typical picture of miliary tuberculosis, and one taken 12 days before death showed confluence of the shadows. Enlargement of the spleen was observed within a few days, but there was neither cough, dyspnea, nor sputum until shortly before death, which was due to meningitis. Most interesting were the blood findings on repeated examination. At first there was a relative mononucleosis with 53 per cent neutrophils, and then

a gradual increase of this type up to 90 per cent. Eosinophils were absent throughout the case.

Ten days after the injection no culture of tubercle bacilli could be isolated from the blood either by Loewenstein's method or by animal inoculation. These results confirm the experiments made by Nocard in 1888 and by Bang in 1891.² The report states that while it is practically certain that bacilli reached other organs in the body, clinical lesions were found only in the lungs and meninges. Another point is that this case appears to prove that under some circumstances exogenous reinfection may overcome immunity acquired from previous clinical disease. It must be remembered, however, that the dose here was overwhelming and we have always taught that immunity was to a large extent relative and can be overcome by various adverse circumstances or a combination of them.

REFERENCES

1. *Brit. M. J.*, Aug. 27, 1938, pp. 458-459.
2. Editorial, *A.J.P.H.*, Sept., 1938, p. 1118.

PUBLIC HEALTH EDUCATION*

Syndicated Health Education—
The "Annual Directory of Syndicated Features" lists the following writers of health columns:

Dr. George W. Crane, Dr. A. Markowitz, John C. Kraus, Dr. Herman N. Bundesen, Dr. Lewis Haney, Dr. Morris Fishbein, Dr. I. S. Cutter, A. J. Balkins, M.D., Stanley Miller, Dr. Frank McCoy, Dorothy Ducas and Elizabeth Gordon, Dr. Iago Galdston, Artie McGovern, Jane Stafford, Dr. William Brady, Dr. James Barton, Dr. W. E. Aughinbaugh, John C. Kraus, Josephine Lowman, Dr. C. N. Chrisman, Dr. Claud N. Crisman, Dr. Logan Clendening, Royal S. Copeland, M.D.

The Directory is included with the Sept. 24, 1938, issue of *Editor and Publisher*, Times Bldg., New York, N. Y. 10 cents.

Exhibits All the Year Round—
At a session of Natl. Conference of Tuberculosis Secretaries, Raymond H. Greenman of Rochester presented "The Use of Exhibits in Mass and Group Education."

Here are selected paragraphs:

We use our exhibit—little stages, pictorial statistics, shaded maps, poster drawings—to arouse interest in a particular need or service; and as we were interested in more than one need, the number of our exhibits has increased.

We find that pictures of real persons are more effective than drawings. We cut up and mounted the figures on billboard posters which we bought from the National Association and our progressive State Committee, and we noted the reactions of our own committee members to the reading of X-ray pictures and posters illustrating approved modern methods of finding and treating early tuberculosis.

We wanted our exhibit material to be in use all the time. We were able to set up a

health teaching center in a vacant home next door to our building. Last October, this center was officially opened, intended especially for the information of professional groups not primarily for the general public. To this center have come doctors, nurses, social workers, health education teachers, in groups of from 20 to 100—more than 1,000 of them. At this center our Board and all our Committees meet—300 representative citizens. Here we show sound motion pictures and here we not only show exhibits but we submit our material to critical analysis. We analyze our points of contact and we follow out the constructive suggestions of our friendly critics. . . .

Now our exhibit service is functioning 12 months of the year instead of only at the time of an exposition or a county fair, or a convention. The sizes of our exhibits vary from 2 feet square, to 15 feet by 10, the larger ones carried by a trailer. All our exhibit material is framed and in good condition, and has the specific approval of our medical advisers.

Fifteen years ago we spent \$800 for a "Healthy House" exhibit during Labor Day Week at the Rochester Exposition. This past year we spent \$500 for the maintenance of our teaching center and 10 exhibits which were carried to all parts of our county.

Next year in the new home of the Rochester Academy of Medicine an exhibit space is being provided on the first floor for a modern "Museum of Health." We are committed to assist in providing exhibit material dealing with modern methods of health preservation. These are intended to be of special interest to doctors' wives who are important people in the community.

How about Staff Conferences?—
We don't know how general are staff conferences outside the nursing groups. As training on the job they ought to serve more groups than nurses only. As a builder of a better working staff they should be of general service.

Our Nurse, City of New York Dept. of Health (June, 1938) answers "Why have staff conferences?" from the viewpoint of nurses:

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

This question was recently put before a group of newly promoted Health Department supervisory nurses. From their own experiences they contributed many and varied reasons. Among them were: to improve services; to discuss a common problem; to present new material; to explain new procedures; to analyze a case history; to encourage staff participation; to raise morale; to plan for the future; to interpret vital statistics; to become better acquainted with each other; to learn the needs of the staff; and to take time out to think what one is doing.

Then here are some of the questions which face those who undertake staff conferences:

How to prepare material for staff conference? how to organize the physical set-up for a staff conference? how to lead the meetings? how to present material? how to summarize? how to meet individual needs? how to get group participation in staff conference? what can be done with a person who dominates? how to bring out silent members? what to do if the group becomes restless and how to stimulate interest?

Exhibits and Museums—The interest of the American Assn. for Health and Physical Education is explained by Agnes Wayman in "Educational Exhibits and a Permanent Historical Museum," in *Journal of Health and Physical Education*, 311 Maynard St., Ann Arbor, Mich. May, 1938. 35 cents.

On the one hand our national organization is encouraging educational exhibits in connection with state, district, and national conventions, and on the other hand it is locating material which might have significance historically in relation to the development not only of our organization but of value in connection with the evaluation of our whole field of education. It is doing this with the hope that eventually we shall have somewhere a permanent historical museum for health and physical education. Before expanding that idea, it might be well to discuss further the first type of educational exhibit mentioned.

With the increased emphasis upon visual education material, some of us realized that as an organization we were missing a big opportunity educationally as well as promotionally, so about 1934 we began to expand this idea of exhibits at conventions for various reasons:

1. As teaching aids they are very suggestive.
2. They help to create interest in the field.
3. They may present material of value historically, physiologically, etc.

4. They serve as propaganda in the promotion of the various phases of our field among (a) our own profession, (b) schoolmen and the more academic side of education, (c) the layman (business and professional men and women, the clergy, clubs, etc.), and thus help to create an interest and a better understanding of our aims and objectives. . . .

It is to be hoped not only that valuable material may be developed which can later be used as museum material but that through these exhibits a greater interest will be developed in actually working out projects for such use. There is, in addition, no doubt that much of value educationally is being destroyed or lost first because we fail to realize its historical significance and secondly because of lack of space. A permanent museum would make it possible to preserve such material for posterity. . . .

Mimeography Need Not Look Dull—It's partly the choice of paper; partly the making of stencils, the use of special tools offered by the manufacturers, and the running of the stencils. But it is also the use of layout devices in the arrangement of material on the page, spacing, titling, capitalization. In other words, good mimeographing calls for attention to detail, understanding the job, giving time and skill in making the most of each job. *If you don't know all of the answers please ask questions and this department will try to supply the answers.*

Remember that there can be little excuse for sloppy, dull looking, hard to read mimeograph work.

MUCH WANTED

We did not have an answer for this letter. What would you write in reply? It is a fairly common request which comes from different parts of the country. Incidentally, it might have helped if the date of the fair had been mentioned. The date helps when one is trying to answer most letters about materials for a specific use.

I am interested in putting on an exhibit at our county fair and I am interested particularly in electrical exhibits, etc., that will teach a lesson in public health, and at the same time attract attention. Something mechanical—or electrical novelty.

Please advise me where I can obtain such material, or rent same, giving prices, etc.

FOR EDUCATION AND REFERENCE

A catalogue of "Children's Bureau and Other Publications Relating to Children." Supt. of Documents, Washington, D. C. Revised. *Free*.

A classified list of social hygiene pamphlets in *Social Hygiene News*, 50 W. 50th St., New York, N. Y. May, 1938. *Free*.

"Common Colds," by Robert Olesen; "Climate and Tuberculosis," by F. C. Smith; "The Notifiable Diseases—1936." By U. S. Public Health Service. Supt. of Documents, Washington, D. C. *5 cents each*.

"Insects" is a catalogue of government publications, including those which treat of insects injurious to man. Supt. of Documents, Washington, D. C. *Free*.

"The Need for a National Health Program: Report of the Technical Committee on Medical Care." Interdepartmental Committee to Coördinate Health and Welfare Activities. Washington, D. C.

Safeguarding America Against Fire, 85 John St., New York, N. Y. Summer, 1938. The annual Fire Prevention Week number. *Free*.

"Tables of Contents of Scrapbooks on Family Budgets, Relief Standards, and Nutrition for Workers in Health and Welfare Agencies," prepared by Social Welfare and Public Health Dept., American Home Economics Assn. Here are 14 mimeographed pages of current and available references to budgets and relief standards; nutrition material for families; food for lunches, camps, etc., and foreign born; special diets; rural communities, etc. Much of it is free, all is inexpensive. *20*

cents. Send to Marjorie M. Heseltine, Room 7135, U. S. Dept. of Labor, Washington, D. C. The scrapbooks containing the material are loaned for express charges both ways.

MAGAZINE ARTICLES

"Where's the Fire?" by P. Boyer, Jr. What 2,000 highway officers think of car drivers. *American Magazine*, 250 Park Ave., New York, N. Y. March, 1938. *25 cents*.

"When the Population Levels Off," by H. P. Fairchild. Social gains when we cease to grow. *Harper's Magazine*, 49 E. 33d St., New York, N. Y. May, 1938. *40 cents*.

"The Doctors Face Revolt," by A. D. Carlson. As to medical care. *Harper's Magazine*, Sept., 1938.

Three pages on dark glasses, types, and properties. *Life*, 350 E. 22d St., Chicago, Ill. May 30, 1938. *10 cents*.

"Bronchoscopist Jackson Retrieves Things Careless People Swallow." Includes 2 pages of pictures of objects removed by Dr. Jackson. *Life*, June 13, 1938.

"Teaching Prospective Fathers to Be Good Mothers": "One Reason Why Milwaukee Is America's Safest City." *Look*, Des Moines, Ia. Aug. 30, 1938. *10 cents*.

"How Smart Are You about Medicine?" True or false questions and answers "to test your knowledge of modern scientific treatment of disease." *Look*, Sept. 13, 1938.

"For the Common Good," by Lewis Mumford. *New Yorker*, 25 W. 43d St., New York, N. Y. Jan. 8, 1938. *15 cents*. Criticism of New York City health center architecture.

"Accidents Are 'Out,'" by H. M. Robinson. What certain industries have done. *Rotarian*, 35 E. Wacker Drive, Chicago, Ill. Aug., 1938. *25 cents*.

"Blood from a Stranger," by J. C. Furnas. *Saturday Evening Post*, Aug.

20, 1938. Blood transfusion; blood donors.

"Medical Rift in Milwaukee," by A. and H. Biemiller. The story of a medical center. *Survey Graphic*, 112 E. 19 St., New York, N. Y. Aug., 1938. 30 cents.

REPORTING

"Annual Report" of Hygienic Institute, La Salle, Ill., helps the eye of the reader of "Comment on Activities of the Institute." There are no sub-headings, but each activity or administrative unit mentioned is brought out in black face type.

COMMENT ON HEALTH CONDITIONS

Analyzing the vital records for the year 1937, there is found some improvement over the previous year, in fact, the deaths are fewer than any year since 1933. During the year 1937 there were 270 official deaths* in the Tri-Cities, which gives an official death rate of 10.2 (per 1,000 population). However, when the figures are adjusted to include residents only it is found that there were actually only 252 deaths to citizens of our community. This gives us a true death rate of only 9.5. This rate compares very favorably with the rate for the state of Illinois, as a whole, which was 11.1 for the same year. In other words, if the state rate had applied in this community for the year 1937 we would have had 42 more deaths. If a human life is valued at \$10,000, this represents a saving of \$420,000. By way of contrast the health department spent during the year \$26,952, and claims some credit for the above saving.

However, many other factors enter into the saving of human life, which are beyond the control of health departments. For instance in 1936 there were 16 deaths from heat stroke alone and not a single one in 1937; and from all violent and accidental causes there were in 1937 only 17 deaths against 50 for 1936. The year just closed showed increases in deaths from heart disease, apoplexy and tuberculosis, but fewer from cancer, external causes, pneumonia, nephritis and diabetes. For comparison and details of life loss see tables Nos. 25, 26 and 34.

The infant death rate for the year showed a decided improvement. There were 13 deaths recorded against 17 for the year before. This gives an official rate for the year of 29.5 (per 1,000 live births) against 40.7 for the year before. When the figures are corrected for residence it is found that there were only 10 infant deaths (corrected births also less), which gives a true infant death rate of 30.7. This compares very favorably with the state rate of 43.0 for the same year.

Two maternal deaths occurred during the year, which gives an official rate of 4.4 per 1,000 births. Unfortunately these deaths occurred to citizens of our own community, so that the true maternal death rate for the year becomes 6.1. For 1936 there was not a single maternal death in the entire community, and therefore the rate was 0.0. La Salle and Oglesby has not had a maternal death for two years. The state for the same year had a rate 3.7, which is the best in its history. If we averaged our rate for the two years, in an attempt to smooth out the great fluctuation that can occur in small populations, the rate becomes 3.1.

The number of tuberculosis deaths increased from 4 in 1936 to 8 in 1937, thereby doubling the official death rate from 15.1 to 30.2 (per 100,000 population). However, some of our deaths occur in the county sanatorium, and when these are

follow. The 2 page report on "Public Health Instruction" includes the statement that

A total of 184 news articles aggregating 2,668 inches of space appeared in the two newspapers of New Haven directly concerning the department and most of them prepared by the department. In addition, considerable other health promotion material was printed covering the work of other health agencies.

"Annual Report" of Massachusetts Society for Social Hygiene, 1937-1938, gives 20 mimeographed pages to addresses at the annual meeting, and a page to the business session. Such a report would be given added interest by having more than 3 headings in 20 pages. The reader would be helped by the inclusion of a "contents" page, especially if it took the form of a concise description of what followed.

The "Health" section of "Annual Report" of Council of Social Agencies, Los Angeles, Calif., is a reminder of the grouping of health agencies as a section of a general council in many cities. In not a few of these cities wise leadership has resulted in more and better health education.

"Milestones along New Haven's Highway of Health" reproduce a series of 8 murals offered by the city Dept. of Health to the local Tercentenary Exposition. In *Health*, New Haven Dept. of Health, May, 1938. Striking portrayal of problems and practices from then to now.

"New, Reestablished, and Reorganized Services of the Dept. of Health: 1935-1938." State Dept. of Health, Harrisburg, Pa.

"Health Week Report" number of *National Negro Health News*, U. S. Public Health Service, Washington, D. C. July-September, 1938. Free.

"A Quarter Century of Nursing Service. Annual report of Visiting Nurse Assn., Stamford, Conn. "Twenty-Five Years Ago" is the record of a day's

*All deaths occurring in Tri-Cities without respect to residence

From Hygiene Institute Report

"Annual Report" of New Haven, Conn., Dept. of Health is lightened by two picture diagrams. If many of the capital letters had been changed to lower case, quicker reading would

service by the one nurse first engaged, with a full page picture of the first nurse astride her bicycle. This record is balanced by "A Day in the District—1937."

"Report Mimeographed by Marian Galizanske" appears on the page after the title page of "Annual Report" of Dept. of Health, Racine, Wis. Mimeographed on one side of the sheet, 45 pages, an index, no mention of health education, 2 simply done picture diagrams, a "Forward" section (lost in the back part of the volume), and a pleasing printed cover page.

To get a picture of the educational-publicity activities of a large city health agency—see "Public Relations Department" in the annual report issue of *Quarterly Review*, New York City Cancer Committee, 130 E. 66th St.

MOTION PICTURES

"Selected Motion Pictures." Catalogue of 16mm silent and sound pictures, free and rental. Includes a few health pictures, and many other educational and diversion pictures for use in clinic waiting rooms, sanatoria, etc. Motion Picture Bureau, Y.M.C.A., 347 Madison Ave., New York, N. Y., or 19 S. La Salle St., Chicago, Ill.

"Visual Review—1938," by M. M. Witham, is an annual issued especially for school people. Of special value to any health worker who wishes to collaborate in visual education in the class room or the general assembly. Includes chapters on the high school newsreel, the use of filmstrips, and the miniature camera. Society for Visual Education, 327 S. La Salle St., Chicago, Ill. *Free.*

New pictures are announced by Health and Cleanliness Council, 5, Tavistock Square, London, W.C.1, England.

The old favorite "Giro the Germ" is to be seen in new adventures in the Council's new cartoon film "Giro Fast and Loose" which is to be issued in the early autumn. Two other new films are also in preparation—

one deals with the homes of mankind from the Garden of Eden to Nisbet House, Hackney, with its up-to-date electric equipment; the other is intended for housewives.

Offered by state and local tuberculosis associations (produced by Natl. Tuberculosis Assn.):

Rex Ingram, who played the part of "De Lawd" in "Green Pastures," plays a leading rôle in "Let My People Live." The picture will run 20 minutes. With an all-Negro cast, it dramatizes facts of tuberculosis as it affects the colored race. "Let My People Live" was filmed entirely at Tuskegee Institute, Alabama, and among its features is the Tuskegee choir of 100 voices, under the direction of William L. Dawson. The Federal Theater Project granted Ingram leave of absence from the WPA stage production, "Haiti" to make "Let My People Live." Other persons in the cast include Peggy Howard and Erastine Coles.

"Diagnostic Procedures in Tuberculosis" is the title of a new 15 minute film prepared for medical societies, public health groups, medical students and nurses. The four eminent specialists who take part in the film are Dr. Kendall Emerson, Managing Director of the National Tuberculosis Association, Dr. Ralph S. Muckenfuss, Director of the Bureau of Laboratories, New York City Department of Health, Dr. Esmond R. Long, Director of the Henry Phipps Institute and Dr. Edgar Mayer, Assistant Professor of Medicine at Cornell Medical School and formerly on the staff of Trudeau Sanatorium.

RADIO

"The Health Hunters," New York State Dept. broadcast over Station WGY, has been moved from 5:00 p.m., Saturdays, to 11 a.m.

If you have use for a list of broadcast stations, ask Federal Communications Commission, Washington, D. C., for a free copy of "List of Radio Broadcast Stations, By State and City."

"Let's Take The Air: A Manual on Radio Production," by John E. Kieffer (with Philadelphia Health Council and Tuberculosis Committee), Pennsylvania Tuberculosis Society, 311 S. Juniper St., Philadelphia, Pa. 25 cents. This will supplement the *Scholastic Magazine*.

BOOKS AND REPORTS

Occupational Diseases in Ohio: Annual Report for 1937—By *Kenneth D. Smith, M.D., and John B. Kistler, M.D.* Columbus, Ohio: Ohio Department of Health, 1938. 52 pp., mimeographed.

Following the general style of the brief annual reports published by the department in previous years, the current report adds 31 tables to the customary summarizing table of Compensable Occupational Diseases, which now covers 10 years (1928–1937 inclusive). A copy of the law covering Compensable Occupational Diseases in Ohio includes the last one to be added—silicosis—which extends the list to 22 named diseases or injuries.

From the date of the first report to the department of an occupational disease, made May 15, 1913, to the end of the year 1937, 22,027 reports were received. About nine-tenths of those reported have been on the compensable list since compensation for this class of diseases began in 1921. It should not be inferred, however, that the compensation list is nine-tenths perfect since physicians are more prone to report afflictions which are compensable.

During 1937, 1,693 reports were received of which 1,390 (82.1 per cent) were males and 299 (17.4 per cent), females—the sex not being learned for 4. The reports were made by 753 physicians, or 8.2 per cent of the approximately 9,200 physicians in the state. The workers were employed by 926 different employers.

As in past years, infection and inflammation of the skin (dermatitis), consequent upon exposures chiefly to irritants, made up about two-thirds (66.1 per cent) of the total cases, and

68.5 per cent of the compensable cases. Of these, 826 (80.4 per cent) were males and 207 (19.3 per cent) were females.

Constitutional poisonings comprised 218 cases of which 195 were lead poisonings.

Wrist-strain (tenosynovitis) affected 155, and "housemaid's knee" (prepatellar bursitis), 26. Of the latter, only 2 were females, however. Ulcers of the nose and skin, due to inhaling chromium compounds, made up 68 cases—11 less than the preceding year.

Silicosis, the last disease to be added to the Compensation Schedule (92nd General Assembly, 1937), was responsible for 40 reported cases, 19 of which were reported before the Act became effective on July 31, 1937. Silicosis cases are only entitled to a maximum of \$3,000, or less than one-half of the \$6,500 permitted for other types of occupational diseases and injuries.

The customary annual inquiry of the 21 tuberculosis sanatoria in the state was not made for the year 1937, but such inquiry has yielded only a comparatively few cases in past years, some of the larger sanatoria reporting no occurrence of silicosis cases. From this it may be assumed that few of these cases gravitate to sanatoria, or are really infected with tuberculosis.

Of the 107 non-compensable reports, 89 were males and 18 females. This group incurred all manner of physical injuries such as heat, cold, friction, pressure, repetitive motions, strains, etc., but included numerous irritants, poisons, and infections not on the Compensation Schedule.

The summarizing tables will be of

particular interest to those concerned with the various afflictions reported. In general, a gradual increase has been noted in the decade, 1928-1937. The report does not go into the matter of premium costs and disbursements, nor does it cover the number of fatal cases—these being matters within the jurisdiction of the Industrial Commission, which publishes monthly and annual summaries separately.

EMERY R. HAYHURST

Osler's Principles and Practice of Medicine—By *Sir William Osler, M.D., (13th ed.)* Revision by *Henry A. Christian, M.D., LL.D.* New York: Appleton-Century, 1938. 1424 pp. Price, \$9.00.

Only an intrepid author would undertake to reëdit the single volume edition of Osler's classic text. This Thirteenth Edition is the work of Henry A. Christian, M.D., Hersey Professor of the Theory and Practice of Physic at Harvard, who succeeds the late Thomas McCrae, M.D., as reviser. Dr. Christian has prepared the revision without the assistance of other experts. In this respect the edition resembles the first, of 1892, which was Osler's own; yet a volume which has had such a profound effect on the practice of medicine amply deserves periodic revision. Readers of the present generation may not remember that it was an early edition of this work which, when called to the attention of Mr. Rockefeller, resulted in very liberal gifts for the promotion of medical science, including the establishment of the Rockefeller Institute for Medical Research.

It is illuminating to compare this 1938 text with the Eighth Edition published in 1916, which was the last revision in which Sir William participated. Although the number of pages has been increased during this 22 year interval by only 16 per cent, the topics have become proportionately more

numerous and they reflect many of the changes in medical knowledge. Topically the volume carries most of the subjects included in the larger systems of medicine.

It is because of this convenient accessibility that the volume is important as a quick reference text readily available to public health workers. On the whole this edition is to be commended on the inclusion of statements consistent with accepted epidemiologic data, but it would be desirable if the statements on incubation time, duration of infection, and recommended periods of isolation were made consistent with the consensus of experts in this field as expressed in the A.P.H.A. report on the *Control of Communicable Diseases*. However, the present edition is much improved in this respect over earlier ones.

The critical reader will recognize modern concepts of the epidemiology of tuberculosis, syphilis, yellow fever, and the diseases of the rickettsia group. He will have to seek the documentation of the evidence elsewhere, and each specialist will doubtless discover areas in which his own opinion differs from the text. He may even wonder whether the time has passed when any person can be expected to take responsibility for all the contents of such a comprehensive volume, much of which of necessity must be other than first-hand knowledge.

Yet the impartial reader will be satisfied that the revision has been the work of as able an author as Dr. Christian and will rejoice that the oncoming generations of medical students may have access to so worthy an edition of William Osler's masterpiece.

REGINALD M. ATWATER

Vitamin B₁ (Thiamin) and Its Use in Medicine—By *Robert R. Williams, Sc.D., and Tom D. Spies, M.D.* New York: Macmillan, 1938. 411 pp. Price, \$5.00.

Vitamins were discovered only about a quarter of a century ago, although clues to the existence of these accessory food factors had been developed by scientists at the beginning of the present century. So rapid has been the progress in vitamin research, however, that now we have an entire book of some 400 pages devoted to only one of the dozen or more vitamins now recognized, catalogued, and synthesized.

The book, one of the medical monograph series edited by Dr. George R. Minot, is an excellent one in every respect. Not only does it give the complete story of thiamin, or vitamin B₁, in relation to food deficiency states and their clinical treatment, but it offers valuable material on the history, the chemical nature, and the physiological applications of this important substance. The book is written in a lucid style by leading authorities, and it is well printed, with a good index.

This treatise is a valuable contribution to the scientific literature on human nutrition. It should be indispensable to all persons who are concerned with the diet of man, a subject which continues to merit serious concern.

JAMES A. TOBEY

Technics for the Bacteriological Examination of Drinking Glasses—
Published in "Health Officers News Digest" by The Public Health Committee of the Cup and Container Institute, 30 Rockefeller Plaza, New York, N. Y., 1938.

This fine collection of laboratory procedures clearly indicates that we have passed far beyond the pioneering stage in the bacteriological examination of eating and drinking utensils. The fact that no two of the technics used in 15 different cities are identical might seem at first thought a fatal objection to the whole procedure. This is actually about as far from the truth as it could possibly be. As a matter of fact, in the

sanitation of eating and drinking lishments, the rôle of the laboratorian is a comparatively simple and minor one. By any of these procedures clear differentiation can be made between cleanliness and filth. Therefore they are all good methods. The sole possible objection lies in the fact that their results are not comparable. The Sub-Committee of the American Public Health Association on Standard Methods for the Examination of Dishwashing Devices has not claimed that its proposed technic is the best possible method. What can be claimed for it is that it is actually in use. The laboratory technicians and the sanitary inspectors working with Cumming in Washington, D. C., through information gained by this method have made their city a safe place in which to eat and drink—soda water.

The proposed technic permits not more than 500 organisms per utensil surface area examined. Is this too liberal? Purveyors of food and drink in Washington who have paid fines and lost their licenses do not think so. In practice this method has produced the desired results. It is a good method, however, chiefly because it has been and is being used.

We know now that the methods which have been in common use for the bacteriological examination of milk during several years past are comparatively crude. Even so, their application has brought about the production of milk far cleaner than that commonly purveyed prior to the widespread use of the plate count.

The eating and drinking utensil examination is a parallel case. It is time to stop calling attention to minor differences in technic. Let a uniform method be adopted, one proved in practice to be a *good* method. Then let us have reported the results of its application. What was the average count per beer parlor at the beginning of this

year, and what is it now? How do your sanitary inspectors operate and coöperate to give the health officer the information which leads to successful prosecution of malefactors. We know all we need to know about the laboratory technic—we want to know more about the field and the court technic.

Fundamentally (and within natural limits): the most useful technic is the most used technic.

Let us therefore adopt one good procedure as a comparable method, then we can all know what we mean when we say we permit not more than 500 organisms per utensil surface area examined.

The most useful is that which is the most used—*ceteris paribus*.

A. P. HITCHENS

Macleod's Physiology in Modern Medicine—Edited by Philip Bard, with the collaboration of Henry C. Bazett, George R. Cowgill, Harry Eagle, Chalmers L. Gemmill, Magnus I. Gregersen, Roy C. Hoskins, J. M. D. Olmsted and Carl F. Schmidt. (8th ed.) St. Louis: Mosby, 1938. 1051 pp. Price, \$8.50.

After defining physiology as "an application of the known laws and facts of physics and chemistry to explain the functions of living matter," Professor Macleod in the first edition of his book *Physiology and Biochemistry in Modern Medicine* argued for the wider use of this science in clinical medicine. By recourse to its methodology and factual material in the study and interpretation of disease, he reasoned, diagnosis would become a science as well as an art. In putting physiology forward as an applied science, he laid out his book accordingly to include only those topics with a practical bearing. Later editions, shorn of the biochemical title and of much biochemical material which had by that time asserted its own place in medicine, reached out into the entire physiological domain regardless of any

immediate practical considerations. If the form thus took on a broader gauge, it did not violate the original spirit of interest in applicability.

The latest edition of *Macleod's Physiology in Modern Medicine*, the first since Professor Macleod's death, is a collaborative work of nine physiologists. Continuing the book's trend, they have carried further its topical expansion. This is a sound design, for usually what may seem at the moment to be a matter of purely academic interest is ultimately found to have its practical turn. This new edition is, therefore, a worthy successor. To designate outstanding features in a book that is of such uniformly high caliber would be a factitious gesture. It is, however, a gratifying commentary on progress in physiology that the section on the neuromuscular system has come to occupy 20 per cent of the space in the present edition.

With the aim at present toward early diagnosis of disease, an aim that often oversteps the range of sensitivity of the usual clinical technic, the desideratum for precise procedures is constantly bringing biochemical and physiological methods into use. To those desiring to keep abreast of developments in physiology, it should be said that this book bears the stamp of authority. It is likewise appropriately designed as a textbook for medical students.

H. D. KRUSE

Cause and Prevention of Disease—By William Harvey Perkins, M.D. Philadelphia: Lea & Febiger, 1938. 713 pp. Price, \$7.50.

This book most certainly presents a novel viewpoint of preventive medicine. It appears to be more of a textbook of philosophy than of medicine. It is an original concept that the body of man is a "falsely isolated interference pattern" and just what that means is not clear to the reviewer.

The entire work is based on Six Categories of the Cause of Disease. No one can object to the classification since it includes all known causes of disease. The categories are: I—Inherited Factors; II—Defects of Nutritive Elements; III—Exogenous Chemical Agents; IV—Physical Forces and Energies; V—Vital Activity of Invading Organisms; and VI—Psychobiologic and Bio-social Influences. Under these various categories there is an immense amount of information packed in a relatively small volume.

About 70 pages are devoted to food and nutrition, 175 to poisons, 85 to mechanical forces and energies, 200 to invading organisms, and 65 to psychobiologic factors. There is an excellent chapter on sex hygiene. Less than a page each is devoted to pneumonia, syphilis, and cancer, all of which are important problems. More space is given to brass founder's ague than to syphilis, more space given to carbon disulphide poisoning than to pneumonia, and three times as much space given to carbon monoxide poisoning as is given to cancer. However, the book is not intended as a textbook on public health administration and it is probably true that the preventive aspects of syphilis, pneumonia, and cancer can be summed up in a few words. Brevity is often an asset in a textbook.

This book would be a difficult one for most students to cover in the time usually allotted for courses in preventive medicine, even if they could understand it. Many of the definitions are not clear. For example, (page 21) "Health is a state of relative equilibrium of body form and function which results from its (sic) successful dynamic adjustment to forces tending to disturb it," and (page 489) Immunity is defined "as a state of resistance and antagonism toward invading organisms due to particular qualities aroused in the tissues of the host in response to particular qualities

possessed by the pathogen." The book would be more readable and more easily understood if fewer and simpler words were used. As it is, much of it is polysyllabic to an extreme.

There are a number of errors which should be corrected in future editions. On page 420, we are told, "The thermal death time of a species of bacteria is the time required to kill the organism at a given temperature or range of temperature. . . . For example, milk is readily sterilized by pasteurization at 63° C. (145° F.) for thirty minutes, its thermal death time at this temperature." This language makes milk a species of bacteria. Sterilization and pasteurization are not synonymous, and most pasteurized milk is not sterile. Again, (page 498) "In rural areas this is most frequently the homestead with its stream, spring, well, or cistern. All of these sources can be readily contaminated the most common coming from circumstances which permit the entrance of human and animal excreta." To what does "the most common" refer? The success of botulinus antitoxin in combating botulism after it has developed is open to question. No mention is made of the use of magnesium oxide for treatment of drinking water containing fluorine.

As a catalog of all the possible ills to which the human being is subject, mentally, physically, and morally, the book is unique. We do not believe the relative amount of space given to different subjects is wise. The author correctly says, "In no other field of preventive practice is there more hope of success than in the science of nutrition"; yet only some 70 pages are given to it against 175 to poisons.

The author has compressed an enormous amount of information into this volume and deserves credit for a refreshing viewpoint in writing what is probably the most difficult book there is to write—a textbook of preventive medicine.

The printing and make-up are excellent, though some misspellings have escaped the proof reader. The index is good.

F. L. ROBERTS

A Textbook of General Bacteriology—By Edwin O. Jordan. Revised by William Burrows. (12th ed.) Philadelphia: Saunders, 1938. 808 pp. Price, \$6.00.

The 11th edition of this well known text appeared in 1935. Since then we have had to mourn the death of the author, and the revision for the 12th edition, which is just off the press, has been made by the Assistant Professor of Bacteriology at the University of Chicago.

Several sections have been entirely rewritten. Owing to the great interest which attaches to the virus diseases and the amount of study given to them, the most extensive revision has been made in the chapter concerning them. Another disease of great importance and on which much work has been done since the last edition, is poliomyelitis, so the section on this disease has been entirely rewritten. The chapter on influenza has been moved into the virus disease section and extended to include the recent work on the identification of the virus. The many new discoveries in regard to yellow fever have required that this subject be considerably amplified. All through there are evidences of careful revision in order to bring the book up to date.

There are, however, still some parts which cannot be regarded as up to the minute. An enormous amount of work has been done on the so-called coliaerogenes group. There is no standard nomenclature for the various related organisms included in this group. The term "coliform" has been proposed by Breed and Norton and is being used in England to a considerable extent. The text still clings to, and quotes at length, the 6th edition of the Report

on Standard Methods of the A. P. H. A., 1925. The Standard Methods of the A. P. H. A. is the only authoritative publication on the subject, but the edition quoted is 13 years old and cannot be regarded as entirely satisfactory in light of the knowledge gained in the meantime. We do not understand why the 8th edition published in 1936 was not quoted. This whole subject is of especial significance in regard to the examination of water and of milk. The text does not even mention the phosphatase test to determine the efficiency of pasteurization.

The volume contains practically the same number of pages of text as the 11th edition. The Index is longer but the total size of the book is nearly 20 pages less, since the Index of Authors given in the 11th edition has been omitted.

The printing and make-up of the book are excellent. The first edition appeared exactly 30 years ago, and since that time it has been a standard. All bacteriologists and teachers have looked forward to the successive editions and have not been disappointed. We welcome the present revision which enables the book to keep the place of usefulness it has held for so long, and keeps before us the name of an honored teacher.

MAZYCK P. RAVENEL

Pasteur: Knight of the Laboratory—By Francis E. Benz. New York: Dodd, Mead, 1938. 232 pp. Price, \$2.00.

This life of Pasteur was written for older boys and girls, and by an author who knew how to do it well. Pasteur's life was dramatic from the time he left by bus from his home village for Paris through all the years of maturity during which he achieved many things for the benefit of mankind. Pasteur was versatile. He started with chemistry and wound up in biology. Occasionally he got into knock-down fights

with real and pseudoscientists. He had a simple Christian faith and was devoted to his family. Tragedy struck him several times. He was finally honored by governments in many countries. All these happenings were amply recorded at the time in documents and letters to give joy and enthusiasm to later authors fired by a zeal to keep Pasteur's light burning brightly in succeeding generations. This is the kind of book which should be in the library of every school and every public health worker who needs well written source material to pass on to the public to make his own local work better understood and kept on the upgrade. W. W. PETER

The Laboratory Diagnosis of Syphilis—By *Harry Eagle, M.D.* St. Louis: Mosby, 1937. 440 pp. Price, \$5.00.

No other tests performed in public health and clinical laboratories are subject to so many ramifications—including technics with their inherent difficulties, opinions of laboratory workers, personal idiosyncrasies—as those used in attempting to aid physicians in the diagnosis of syphilis. Experts will disagree on every phase of the laboratory work, methods as well as interpretation of results. The author has rendered a real service in presenting an extensive discussion of the more important laboratory tests and the theoretical bases for them. Although the book can be read intelligently only by well trained and experienced laboratory workers, it should be placed in the hands of all those engaged in serological laboratory diagnosis. If no other purpose is served than to confuse the inexperienced or inadequately trained laboratory technician, of whom we suspect there are altogether too many, to the point where tests for diagnosis of syphilis will be discontinued, the author's effort will not have been entirely in vain.

It is not possible even to mention many of the very excellent discussions, in our opinion the best now available. Much time and care on the author's part are evident in all of them. The Wassermann reaction is thoroughly discussed both from a theoretical and a practical standpoint, including a summary of commonly encountered difficulties. Three modified Wassermann procedures are described. One is the author's own technic, the second is the Kolmer method, and the third a procedure using human cells. The value of including this last is doubtful because of the admitted difficulties involved but is justified by the author on the basis of possible non-availability of sheep cells.

The mechanism of the various flocculation tests and the factors influencing the results are discussed in considerable detail in an effective and clear manner from the standpoint of colloidal chemistry. The basic reaction in both the flocculation and Wassermann tests is regarded as identical. The "reagin" of syphilitic serum is regarded as a "specifically reactive globulin which is deposited on the surface of the antigen particles." This film acts as a protein sensitizing agent in the flocculation test. The summary of requirements for a satisfactory flocculation test should be read by those interested in choosing one of the various methods in vogue. Seven flocculation technics are described: Eagle, Hinton, Kahn, Kline, Meinicke, Müller-Bollengs and Sach-Georgi-Witelesky. The author apparently prefers those tests which depend on "clarification" (Eagle, Hinton) as against those dependent on "opacification" (Kahn). It must not be inferred, however, that other than a broad view has been taken. The chapter dealing with comparison of serologic technics, including a discussion of the relative methods of Wassermann and flocculation tests is particularly to be

commended. The author recognizes that there is something more to be considered in choosing a test than sensitivity and reliability, *i.e.*, "technical simplicity" and "reproducibility" under the conditions of work.

The discussions of the interpretation of the results of serologic tests are recommended for consideration of laboratory workers and of those for whom the tests are made, physicians.

The book leaves the reader with respect for the author's opinions and admiration for his ability in accomplishing so well such a difficult task.

JOHN F. NORTON

Dynamic Causes of Juvenile Crime—By *Nathaniel D. M. Hirsch, Ph.D.* Cambridge, Mass.: *Sci-Art Publishers*, 1937. 245 pp. Price, \$3.25, plus 15¢ postage.

This is a challenging book. It is based upon a wide experience as a clinical psychologist and a detailed study of 1,000 case histories of delinquent children, a number of typical individual case reports being summarized. The author classifies the causes of juvenile crime under 4 main headings, 2 of which are not usually considered in similar studies. To heredity and environment Dr. Hirsch has added "accidental causation" which he has "defined negatively as that causation which has social effect but is beyond environmental control; is independent of hereditary functioning and also relatively unrelated to the social causation inaugurated by genius." "Genius," he feels, while "an elusive and only mediate cause of juvenile delinquency," has an enormous influence upon "the spirit of the nation, community, age." "When there is a dearth of geniuses, or when the dice of the times are too heavily loaded against them, second and third rate 'leaders' occupy positions of first rate responsibility. The spirit of the nation and of

the age reflects these leaders and, not merely bread and circuses, but kidnappings and mutilations become the demand and ideals of the day."

According to the author, juvenile crime is a symptom complex resulting from pluralistic causation and forming a *gestalt* which may be considered under one or more of the following: (1) Defective intelligence, (2) General instability, (3) Hyper-suggestibility, (4) General immaturity, (5) Home conditions, and (6) Neighborhood. The author challenges the generally accepted view that broken homes and a poor milieu are highly significant factors in the production of juvenile delinquency. As contributing factors he mentions: (1) Psychopathic Personality, (2) Constitutional Inferiority, (3) Adolescent Paranoid types, (4) Endocrine Disturbances, (5) Emotional Conflicts, and (6) Inferiority Complexes. The stand is taken that delinquency is grounded in many causes and that no one cause is usually responsible for juvenile crime. These causes are well analyzed and discussed and data tabulated to substantiate the conclusions reached.

In the Summary and Suggestions Dr. Hirsch gives us a clear picture of the results of his study. His philosophic deductions are thoroughly pessimistic and hold very little hope for the immediate future. Only through the miracle of spontaneous generation of a galaxy of men and women of genius can we be saved from the corrosion of crime!

We are applying only ineffective palliatives today. "No solution of any of the myriad of major problems is possible without the sudden appearance of men of Genius—men with kingly chromosomes, of philosophical mold, of far-reaching vision. Without such a miracle there is no salvation for the Western World of 1936. But perhaps the gods are again interested in our

planet and will create a bevy of philosophical, kingly geniuses by the sowing of dragons' teeth."

L'homme propose, et Dieu dispose!
RICHARD A. BOLT

Social Agency Boards and How to Make Them Effective — *By Clarence King. New York: Harper, 1938. 102 pp. Price, \$1.25.*

The thesis of this small volume is that social work in any one community cannot long remain at a level above that wanted by a majority of the citizens, and that a good board is the best medium yet found for interpreting social work to the public as well as the community's wishes to the agency staff.

Pointing out the advantages and disadvantages of boards, the author gives practical and concrete advice as to how to make good ones, taking up the problem from the viewpoint of both the private and the public agency. He discusses who should be members, how much authority they should exercise, and what the relationship of the board to the community and to the executive of the agency should be.

The book should be profitable reading for all who are or plan to be board members, as well as to the members of staffs of agencies that have boards or are considering having them. It should certainly be read by anyone who is considering taking a position that will include dealing with an agency board.

CATHERINE GROVES PEELE

Fearfully and Wonderfully Made: The Human Organism in the Light of Modern Science—*By Renée von Eulenburg-Wiener. New York: Macmillan, 1938. 472 pp. Price, \$3.50.*

This book contains 32 chapters, an appendix, bibliography, index, and covers an astonishing variety of topics. These include the physico-chemical

properties of the cell, cell division, fertilization of the ovum, chromasomes, genes, embryology. Some of the other major topics are the structure, function, and mechanisms of the various tissues and organs; the digestion and absorption of carbohydrates, fats, proteins, and mineral salts; the intermediary metabolism of the various nutrients, and the end products of their metabolism including energy; chemical asymmetry; ductless glands and hormones; vitamins.

The final chapter is, "The Human Organism as a Whole," and the diversity of its content may be indicated by a few of the subjects discussed. These include: "The genes as electromagnetic fields. Death as an organismic phenomenon. Memory as a function of living substance. Bio-electric phenomena. The new physics and the biologists' interpretation of life."

The wide variety of material throughout the book is indicated by a few selected minor topics. These are: "Emulsification; physical forces of surfaces, surface tension, and division of liquids into drops. Physico-chemical structure of water. Physico-chemical laws of gas exchange: diffusion, solution, partial pressure, and density. Electron, proton, neutron and position. The rôle of electrolytes in physiological functions. Methods of expressing hydrogen-ion concentrations."

Needless to say most of the content will sound more familiar to the lay reader than the topics listed above. For the most part it is a straightforward account of established facts, with definite acknowledgment of the limitations of our present knowledge. The citations to the literature end with the year 1936. As suggested by the title, and appropriately in this type of book, there is also considerable of hypothesis, and of speculation. These are necessary if the frontiers of our present knowledge are to be expanded.

Much of the content of this book is outside of the reviewer's training and experience, but he is convinced that the author is a serious and conscientious student, and that with minor exceptions the factual content is authentic. There are some lapses however in the portions of the book which the reviewer feels able to read critically; so it is assumed that they occur in the other portions also. For that reason the reviewer believes that when reading this book any student who is attempting to become a specialist in any phase of biological science should be on guard. For the lay reader who wishes to satisfy his curiosity as to the structure and mechanisms of the body these errors are probably of no consequence.

The book is written in textbook style, with no effort at embellishment, and no attempt to introduce so-called human interest features. The book was not written for entertainment, but to supply a broad outline of the structures of the body, and of the mechanisms by which its functions are performed. It is sketchy, of necessity, but it was written for those who want a composite picture of all phases of human biology, showing the important facts in their relations to each other.

Some scientific equipment is necessary to read the book with any understanding, and the minimum prerequisites would seem to be zoölogy and organic chemistry. It is impossible to make easy the understanding of a complicated and difficult subject. As indicated previously a few errors have crept into the text, examples of which are listed below.

Page 43, "if milk suger is ingested . . . it is practically left intact." This is not in accord with experimental evidence. Page 58, "ammonium" is used as a noun. Current usage would make it read ammonium hydroxide. Page 133, "obviously the representatives of life do not follow the second law

of thermo-dynamics." This would deny that the earth receives energy from the sun. Page 147, "The exact composition of the fat is a characteristic for each species." This statement is usually true, but it does not apply to swine. Page 179, "The addition of charcoal (to water) may bring about a reduction in total volume of as much as 25 per cent." The reviewer was unable to verify this statement. Page 193, "Air contains approximately 140 gamma of iodine per liter." The reviewer believes such an amount would be distinctly visible, and highly toxic. The statement could not be verified. Page 219, "The neutral sodium phosphate, Na_2HPO_4 . . ." The titration curve of a 0.1 M solution of phosphoric acid indicates that the pH of the di-sodium salt is over 9, decidedly alkaline. Page 271, the discussion of vitamin D contains no intimation that ergosterol is not the only provitamin D.

In connection with the discussion of obesity on page 132, the author deprecates attempts to remedy the condition before the cause is established. Everyday experience indicates that it may be inadvisable to wait that long.

A. G. HOGAN

American Foundations for Social Welfare—Compiled by Russell Sage Foundation Library, Bertha F. Hulsemann, Librarian. New York: Russell Sage Foundation, 1938. 66 pp. Price, \$50.

This pamphlet lists 157 foundations interested in promoting social welfare, giving information as to how they came to be established, the amount of money involved, the purposes they are designed to serve, and the names of executive officers. In addition 31 community trusts are listed. The foundations are listed alphabetically and according to their principal interest. The pamphlet has been revised as of April, 1938, and should be of value to anybody interested in a particular foundation as well as to those who wish to find out what foundations are active in any special field, such as regional planning or eugenics.

CATHERINE GROVES PEELE

Das Leben der Frau—By Bruno Gebhard, M.D. Stuttgart: Union Deutsche Verlagsgesellschaft, 1937. 232 pp., 107 ill.. Price, \$5.00.

From the pen of a well recognized leader of those who are attempting to guide the public through the maze of modern scientific knowledge it is not surprising that this volume is an unusually straightforward, readable, and simple account of the problems of women from puberty to old age. Dr. Gebhard, known chiefly to American public health workers for his contributions to the German Hygiene Museum in Dresden and now as a consultant to the New York World's Fair Committee, has proved himself to be proficient in presenting facts by the printed word as well as by the exhibit. His use of the visual method has nevertheless added greatly to the attractiveness of the present volume in supplying 107 graphs, diagrams, photographs, and drawings—a most interesting collection.

The subject material covered is varied—anatomy, physiology, psychology, sociology, religious attitudes, political movements and how they may influence the development, status and rôle of the woman of today. Courtship, marriage, divorce, menstruation, pregnancy, motherhood, care of children, menopause, the unmarried woman—all are discussed frankly and simply—in terms which any woman should understand and from a point of view which does not isolate her but links her effectively to all phases of modern life.

The author has chosen from the many theories of the day a sensible one which will satisfy the needs of the woman who wishes to know what modern science seems to know about her.

The scientific reader will probably wish that Dr. Gebhard had somewhere tucked in a bibliography—or at least given the sources for some of his interesting statistics—but let him be content to learn how to state his facts

lucidly and, if his German is not very fluent, be happy that Dr. Gebhard has not written that language in a style which is difficult for English readers.

LEONA BAUMGARTNER

Successful Living—By W. Béran Wolfe. New York: Farrar & Rinehart, 1938. 180 pp. Price, \$2.00.

Human beings, contends Dr. Wolfe, may be the "captains of their souls" so far as happiness is concerned; even the blows of destiny are alleviated through a correct psychological approach to the problems involved. By means of an ingenious illustration termed the "Wheel of Life," one quickly learns (or suspects) that he is infantile, adolescent, or mature in outlook; average or superior in intelligence. Then, through the author's stimulating suggestions, one can work out his own problems which may involve social maturity, leisure time, sex, education, health, religion, dress, politics, culture, vital philosophy, self esteem, marital and family relationships, failure, etc. The result may convince one that what is laid to cruel and heartless destiny, may originate in one's own ignorance and lack of coöperation.

Thus, we may either "muddle through," which for the author is a matter of accepting life as it is—suffering when it is hard, enjoying it when it is pleasant, meeting or evading difficulties when they appear—or we may become more objective in our relationships. He grants that a completely objective human being does not exist, except as a really great hero, but this, of course, is no excuse for attempting to evade the adjustments forced on us by the compulsion of intelligence.

This book is to be recommended as a good investment, at least as an adjunct for mental pruning equipment, and it is of a high degree of useability for men and women in active life.

N. M. GRIER

Swimming and Diving—By *American Red Cross*. Philadelphia: Blakiston's, 1938. 271 pp. Price, \$.60.

Following a brief history of swimming and the development of different styles of swimming, this text discusses in turn learning how to swim, covering such factors as floating, turning, and stroking, and then takes up the elements of swimming, discussing the technics of various styles and strokes. Each type of stroke is described in

considerable detail. About one-third of the text is devoted to the history, style, and technic of diving.

This is an excellent text. The various procedures are carefully described in an interesting manner. Numerous illustrations add to its value. It might well be a part of the library of any instructor in physical education whether or not actually engaged in the teaching of swimming.

CHARLES H. KEENE

BOOKS RECEIVED

PUBLIC HEALTH ADMINISTRATION IN MARYLAND. Maryland State Planning Commission. Baltimore: Maryland State Planning Commission, 1938. 153 pp. Price, \$1.00.

APPERTIZING OR THE ART OF CANNING: ITS HISTORY AND DEVELOPMENT. By A. W. Bitting. New York: The Glass Packer, 1937. 857 pp. Price, \$7.00.

THE ETIOLOGY OF TRACHOMA. By Louis A. Julianelle. New York: Commonwealth Fund, 1938. 248 pp. Price, \$3.25.

AIR CONDITIONING FOR COMFORT. By Samuel R. Lewis. Chicago: Kenney Publishing Co., 1938. 285 pp. Price, \$2.50.

LILLIAN WALD. NEIGHBOR AND CRUSADER. By R. L. Duffus. New York: Macmillan, 1938. 371 pp. Price, \$3.50.

REFERENCE HANDBOOK FOR NURSES. By Helen F. Hansen. Philadelphia: Saunders, 1938. 347 pp. Price, \$1.50.

YOU AND YOUR HOSPITALS. By Ryllis Alexander Goslin and Omar Pancoast Goslin. New York: United Hospital Fund. 59 pp.

HOUSING YEARBOOK 1938. By Coleman Woodbury, Editor. Chicago: Public Administration Service, 1938. 315 pp. Price, \$3.00.

SLEEP! THE SECRET OF GREATER POWER AND ACHIEVEMENT. By Ray Giles. Indianapolis: Bobbs-Merrill, 1938. 290 pp. Price, \$1.75.

HEALTH, HYGIENE AND HOOEY. By W. W. Bauer. Indianapolis: Bobbs-Merrill, 1938. 322 pp. Price, \$2.50.

NUTRITION AND DIET THERAPY. A Textbook of Dietetics. By Fairfax T. Proudfit. (7th ed.) New York: Macmillan, 1938. 923 pp. Price, \$3.00.

PUBLIC WELFARE IN TRANSITION. Department of Public Welfare Annual Report for the Year 1937. William Hodson, Commissioner. 1938. 132 pp.

PEDIATRIC NURSING. By M. Corinne Bancroft, Elizabeth Pierce and Bessie Cutler. (3d ed.) New York: Macmillan, 1938. 652 pp. Price, \$3.00.

A TEXTBOOK OF MEDICAL BACTERIOLOGY. By David L. Belding and Alice T. Marston. New York: Appleton, 1938. 592 pp. Price, \$5.00.

HOW TO MAKE GOOD MOVIES. Rochester, N. Y.: Eastman Kodak Company, 1938. Price, \$2.00.

LAWS RE. SANITIZATION: REGULATORY MEASURES CONCERNING THE SANITIZATION OF EATING AND DRINKING UTENSILS IN PUBLIC PLACES. Published by The Public Health Committee of the Cup and Container Institute, 30 Rockefeller Plaza, New York, N. Y., 1938. 39 pp.

SANITIZATION OF THE DRINKING GLASS. PART ONE, METHODS AND PROCEDURES—by Jack G. Baker. **PART TWO, PRACTICAL CONTROL**—by Raymond V. Stone, D.V.M. Published by the National Association of Sanitarians, Inc., 678 South Ferris Avenue, Los Angeles, Calif., 1938. 60 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

State Medicine Bogey Interred—Editorializing upon the twenty-five year progress of health insurance in Great Britain, the gains in people covered and stability of finances are enumerated. Another important step is the provision of postgraduate training of insurance doctors. Despite the fear that health insurance would degrade medical practice, experience has shown it to have the opposite effect. Increase in drug prescribing is decried.

ANON. *The Progress in Health Insurance.* *Lancet.* 2, 8:439 (Aug. 20), 1938.

Why Women Worry—If we are to believe the picture drawn by this British gynecologist, the average woman's life must be pretty dreadful. In adolescence she suffers from fears and disappointments; her business career may be difficult and unhygienic; her childbearing may leave impaired sex organs because postnatal supervision is often neglected or superficial; menopause brings new grief: infirmities of old age close this gloomy picture.

BOURNE, A. *Influences Which Undermine the Health of Women.* *J. Roy. San. Inst.* 1, 12:705 (Sept.), 1938.

Cheers for Engineers—After recounting the contributions of the engineer to public health in the usual fields of accident prevention, public sanitation, housing and nutrition, the author points to the still greater contributions that engineers may make. Worry, he says, has wrecked more lives than tuberculosis has. Economic insecurity is the great cause of worry. More stable industry, which engineers will some day effect, will cure the condition.

DAVIS, H. N. *Engineering and Health.* *Sci. Month.* Oct., 1938, p. 328.

Mind Over Matter Department—These researchers gave some "cold-susceptible" students cold vaccines; to others they gave injections of saline, but let them think they were getting vaccine. You have guessed it! Both groups were helped greatly and about equally. Some who received the saline were helped so much, in fact, that they went the next season to the family physician for repeat "vaccine" treatments.

DIEHL, H. S., *et al.* *Cold Vaccines.* *J.A.M.A.* 111, 13:1168 (Sept. 24), 1938.

For the First Time, a National Health Program—Good reporting that catches the spirit of the recent National Health Conference held in Washington, which found public health services grossly insufficient, institutional facilities inadequate, a third of the population receiving little or no medical care, and even more Americans suffering from burdens created by illness.

HALL, H., and KELLOGG, P. *The Unserved Millions.* *Survey Graphic.* 27, 9:437 (Sept.), 1938.

Drinking Drivers Cause Accidents—Interesting research is reported in the field of drinking and driving. If you are carrying the equivalent of 0.5 parts of alcohol per thousand or less in your blood, you are not more likely to cause an accident than if you had not had a drink. Greater concentration of alcohol increases your liability to driving accidents. Most drinking-driving occurs in the wee small hours, especially at the

week-end, and alcohol is a major cause of automobile accidents.

HOLCOMB, R. L. Alcohol in Relation to Traffic Accidents. *J.A.M.A.* 111, 12:1076 (Sept. 17), 1938.

Milk for Premies—How 4,000 quarts of breast milk were procured, pasteurized, preserved, and dispensed in New York City. Statistics about the other nine municipal milk stations are given. If human milk were everywhere available, it is suggested that most premature baby deaths could be prevented.

LAWS, C. H., and SKELLEY, E. G. A Maternal Milk Laboratory. *Am. J. Nurs.* 38, 8:859 (Aug.), 1938.

Toward the Control of Cancer—Evidence of the value of the Massachusetts cancer program is found in the reduction of the adjusted cancer death rate for women which has taken place since the project started; in the lessening of the average time between first symptoms and the institution of treatment, and the marked increase in the number of physicians using the diagnostic services.

MACDONALD, E. J. The Evolution of Cancer Control in Massachusetts. *Med. Woman's J.* 65, 9:264 (Sept.), 1938.

Pediatricians Please Note—If cow's milk disagrees with the baby, try adding dehydrated apple to the formula; less hydrochloric acid is needed and a soft curd is assured.

REITHEL, F. J., and MANVILLE, I. A. Adv-

vantages of Adding Apple to Milk Formulas. *Am. J. Dis. Child.* 56, 2:235 (Aug.), 1938.

When Pregnancy Complicates Tuberculosis—At least 30,000 tuberculous women become pregnant every year. What to do about them? Mostly it depends upon the condition of the mother, the facilities for prenatal care, the disposition of the baby. The prospect isn't a pretty picture, for a third of the mothers die within a year of delivery: good obstetrical care, or therapeutic abortion could improve the situation.

SKILLER, J., and BOGES, E. Pregnancy and Tuberculosis. *J.A.M.A.* 111, 13:1153 (Sept. 24), 1938.

Neonatal Deaths—Reviewing the cause of death of all the children who died among those born in New York State in 1936, it was found that the first-born and those high in order of birth had a higher neonatal mortality than the "in-betweens." More than half the neonatal deaths were among "premies," the rate being twenty-five times as high as among full-term infants. Boy babies had a higher neonatal mortality than girls, and very young or old mothers had more trouble in this regard and in the matter of stillbirths than those between twenty and thirty years. The age of the father, too, influenced neonatal mortality. Conclusion jumpers will find this article much to their liking.

YERUSHALMY, J. Neonatal Mortality by Order of Birth and Age of Parents. *Am. J. Hyg.* 28, 2:244 (Sept.), 1938.

ASSOCIATION NEWS

OFFICERS, 1938-1939

President, ABEL WOLMAN, DR.ENG., Baltimore, Md.

President-elect, EDWARD S. GODFREY, JR., M.D., Albany, N. Y.

First Vice-President, A. GRANT FLEMING, M.D., D.P.H., Montreal, Que., Canada

Second Vice-President, LEONIDES ANDREU ALMAZAN, M.D., Mexico City, D. F., Mexico

Third Vice-President, EDWIN H. SCHORER, M.D., DR.P.H., Kansas City, Mo.

Treasurer, LOUIS I. DUBLIN, PH.D., New York, N. Y.

Executive Secretary, REGINALD M. ATWATER, M.D., DR.P.H., New York, N. Y.

Chairman of Executive Board, JOHN A. FERRELL, M.D., DR.P.H., New York, N. Y.

The Annual Meeting in 1939 will be held in
Pittsburgh, Pa.

Sedgwick Memorial Medal Awarded Wade Hampton Frost, M.D.

ON behalf of the Sedgwick Memorial Medal Committee, the following announcement was made by Dr. Haven Emerson at a General Session of the American Public Health Association meeting at Kansas City on October 25.

"The Sedgwick Memorial Medal, awarded in 1938 to Dr. Wade Hampton Frost, was given to him in Baltimore on April 11 through the hands of his wife. Swift and irreparable disease which soon after took Dr. Frost upon his last journey deprived us of that opportunity to express in his presence the full measure of our respect and affection for him, to which this moment in our proceedings is devoted.

"Born as it were in the midst of medical practice, and fortunate in the foundations in his chosen profession, his gifts of character and intellect combined with the instincts of the scholar to mark his work and influence with distinction.



Wade Hampton Frost, M.D.

"His rigorous honesty of approach and a fine scorn for any other facts than those of enduring worth, drew to him students and colleagues who cherished

the gentle persuasiveness and the judicious encouragement of his helpful criticism. His readiness to lose himself in looking through and beyond the problems of all who came seeking the generosity of his attention was notable.

"While his illuminating contributions in the fields of poliomyelitis, influenza, diphtheria, and tuberculosis stand high among the classics of epidemiology, perhaps his planning, direction, and scientific guidance of the stream pollution laboratory at Cincinnati will prove to have been his most abundant legacy to the expanding fields of the theory and practice of public health.

"And yet the breadth of influence which was his can be measured best by other products than his publications or his administrative services, pregnant as these were with creations of his thought and industry.

"As the spirit of Sedgwick carries along now in the second generation a strong current of pure biology and applied sanitation through the lives of his former students and their disciples, so we have here among us, and know in many a foreign land, of the army of young men and women whose thoughts have been made broader, yet more precise, and whose hearts have been

touched by the warm nobility, and their lives by the distinctive superiorities of mind and manner of Wade Hampton Frost.

"He all but created for this country, and our generation of servants of the public health, the scientific discipline and the productive study of epidemiology. He inevitably, and all but unconsciously, put every member and Fellow of our Association under permanent obligation for the clarity of his thought and the beautiful simplicity and directness of expression with which he clothed the studies he made and the conclusions he wisely drew from them.

"We should each add honor to our respective profession and keep alive among our successors at least part of the lives of Sedgwick and Frost if we could capture and use in our own days' work some of their rare and precious qualities.

"Integrity of purpose and method in all his work, intellectual power of rare and extensive scope, a pervading courtesy in every human relationship—for these alone of his many fine qualities Dr. Frost will be remembered with enduring affection by all who knew him personally or only by his written words."

Statement of Dr. Leonides Andreu Almazan, Director of Public Health, Federal Department of Health, Mexico City, D. F.,
for presentation at the Second General Session of the
Sixty-seventh Annual Meeting of the A. P. H. A.,
October 27, 1938

IT is indeed a great honor for the public health authorities of Mexico to have received the gracious invitation of the American Public Health Association to attend this convention, and I beg to convey to you the cordial greetings of President Lazaro Cardenas and of my colleagues and collaborators of the Public Health Services of Mexico.

One of my collaborators will explain to you in detail, at some opportune moment, the different activities and advancements made in public health and sanitation in Mexico by the Federal Health Department under my direction.

For the moment, I wish to report our grateful appreciation of the helpful co-operation which the Rockefeller Foun-

dation has extended to Mexico in public health problems and in granting fellowships in the universities of the United States for the training of health personnel—health officers, sanitary engineers, and public health nurses—as well as in detailing to Mexico its representatives, Drs. Bailey and Earle, to coöperate with the Mexican Government in dealing with its health problems. I wish to express my sincere and grateful appreciation and also that of my government to this philanthropic Foundation for its valuable coöperation in improving the well-being and prosperity of my country.

As to the most important activities of our program for the coming year, I might mention

1. The improvement of existing potable water supply systems and creation of new systems in as many rural areas as possible, aiming to reduce the mortality due to water-borne diseases.

2. Increasing the campaign for the relief and control of malaria, a disease which causes a great deal of illness in Mexico, and for which there will be appropriated the sum of three million pesos.

3. Creating a tuberculosis consciousness in the entire country and intensifying and coördinating our activities for the relief of this plague. Organizing a committee to solicit private coöperation to aid the official agencies.

4. We are giving consideration and sympathetic aid to this great country in the campaign for the control of narcotics and addicts and in preventing criminal activities resulting from smuggling of narcotics into the United States.

In conclusion, I wish to convey to the American Public Health Association my sincere hope that this convention may be most successful in its efforts for the benefit of mankind the world over.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Robert J. Alexander, M.D., 2033 S. State St., Salt Lake City, Utah, County Physician
Norman G. Angstadt, M.D., New Martinsville, W. Va., Director, Wetzel County Health Dept.

Charles H. Bondurant, M.D., Wytheville, Va., Wythe County Health Officer

A. Frank Brewer, M.D., C.P.H., Solano County Health Dept., Fairfield, Calif., Director

Watkins A. Broyles, M.D., Bethany, Mo., Deputy State Commissioner of Health

Wallace E. Childs, M.D., M.P.H., 226 W. Broadway, Princeton, Ind., Director, District Health Dept. No. 1, State Board of Health

James O. Hood, M.D., 420 E. Keith, Norman, Okla., Director, Cleveland County Public Health Unit

William C. Hunsicker, M.D., 1625 Race, Philadelphia, Pa., Director, Dept. of Public Health

Samuel B. Johnson, M.D., Box A, Franklin, W. Va., Pendleton County Health Officer

Henry W. Kassel, M.D., City Hall, Kansas City, Kans., Assistant Director of Health

E. E. McDaniel, D.O., Cassville, Mo., County Physician

Carlos M. Patterne, Dept. de Sanidad, Mayaguez, P. R., Chief Inspector

Elihu F. Sloan, M.D., Columbiana, Ala., Shelby County Health Officer

Lawrence C. Snow, M.D., Medical Arts Bldg., Salt Lake City, Utah, Assistant County Physician

Thomas G. Ward, M.D., St. Joseph, La., Director, Tensas Parish Health Unit

Burton L. Zinnamon, M.D., Sonoma County Health Dept., Santa Rosa, Calif., Health Officer

Laboratory Section

Alonzo T. Barrett, 2534 Brinker Ave., Ogden, Utah, City Bacteriologist

Parker R. Beamer, 362 Chemistry Building,

Urbana, Ill., Bacteriology teacher, University of Illinois

Thelma E. DeShazo, 412 E. 5th, Austin, Tex., Field technician, State Dept. of Health

Justus Goslaw, M.D., Cedar Grove, N. J., Chemist and Bacteriologist, Division of Water (Newark)

Gertrude McGrath, 1030 Rowland Ave., Kansas City, Kans., City technician

William M. Moody, M.D., 2109 Clifton Ave., Cincinnati, O., Bacteriologist, Health Dept.

Hildrus A. Poindexter, M.D., Ph.D., Howard University, School of Med., Washington, D. C., Professor of Bacteriology, Preventive Medicine and Public Health

Dorothy Rodgers, 410 E. Capital Ave., Jefferson City, Mo., Laboratory technician, State Dept. of Health

Lila E. Suiter, Santa Maria Hospital, Santa Maria, Calif., Bacteriologist and Laboratory technician

Vital Statistics Section

Henry W. Gibbons, M.D., 930 J St., Sacramento, Calif., Medical Director, California Western States Life Ins. Co.

Claud C. Ham, 603 Decatur N.W., Washington, D. C., Associate Statistician, Social Security Board

Elizabeth H. Pitney, Yale School of Medicine, New Haven, Conn., Graduate Student, Dept. of Public Health

David M. Wolfe, M.D., C.P.H., State Dept. of Health, Atlanta, Ga., Assistant Director, Bureau of Vital Statistics

Public Health Engineering Section

Frederick A. Brown, Los Lunas, N. Mex., District Sanitarian, State Dept. of Public Health

Paul D. Haney, State Board of Health, Lawrence, Kans., Chemical Engineer, Div. of Sanitation

George K. Hendrix, Box 161, Carbondale, Ill., Sanitary Engineer, State Dept. of Public Health

Arthur D. Jackson, Jr., Lee County Health Dept., Jonesville, Va., Sanitation Officer

James M. Jarrett, State Board of Health, Raleigh, N. C., Consultant in Sanitary Engineering

Benedict A. Lacombe, Echo, La., Sanitary Inspector, Desota Health Unit

Paul Lange, 812 Grove St., Emporia, Kans., Sanitarian, Lyon County Health Dept.

Maurice LeBosquet, Jr., 516 New Post Office Building, Chicago, Ill., Associate Public Health Engineer, U. S. Public Health Service

Felix C. Pickron, P. O. Box 88, Damascus,

Ga., Assistant District Supervisor, U. S. Public Health Service

Blucher A. Poole, 201 State House Annex, Indianapolis, Ind., Chief Engineer, State Board of Health

Abram Pratt, 823 McVicar Ave., Topeka, Kans., District Supervisor, U. S. Public Health Service

Clement L. Richardson, State Board of Health, Jacksonville, Fla., State Shellfish Inspector

Milo R. Simmonds, Antlers, Okla., Assistant Sanitary Engineer, State Dept. of Health

Industrial Hygiene Section

Beatrice Mintz, M.D., 27 W. 96 St., New York, N. Y., Associate Industrial Hygiene Physician, Division of Women in Industry, New York State Labor Dept.

Kenneth M. Morse, 1800 Fillmore, Chicago, Ill., Industrial Hygiene Engineer, State Dept. of Public Health

Harold H. Steinberg, M.D., 3907 W. Gladys Ave., Chicago, Ill., Industrial Hygiene Physician, State Dept. of Public Health

Food and Nutrition Section

Glenn E. Merrill, Dept. of Public Welfare, Wichita, Kans., Chief Milk Inspector

Child Hygiene Section

Gertrude E. Cromwell, Room 10, City Hall, Des Moines, Ia., Supervisor, Health Education and School Nursing, Public Schools

Bess W. LeFevre, 132 E. Como St., Columbus, O., Nursing Consultant, State Dept. of Health

Vernon W. Lippard, M.D., 303 Ninth Ave., New York, N. Y., Director, Commission for Study of Crippled Children

Roland H. Loder, M.D., 1003 State Capitol Bldg., Lincoln, Nebr., Director, Division of Maternal and Child Health, State Dept. of Health

Katherine M. Schweikart, Cambrian Hotel, Jackson, O., Field Nursing Consultant, State Dept. of Health

Public Health Education Section

Adelbert B. Allen, M.D., Piermont Ave., Piermont, N. Y., Taking Health Officers Extension Course

Abe E. Bath, Natchitoches, La., District Supervisor, U. S. Public Health Service

Archie W. French, 2203 Devonshire, Houston, Tex., Director, Health Education, University of Houston

Rosamond A. Losh, 1020 McGee, Kansas City, Mo., Executive Secretary, Kansas City Children's Bureau

Fannie B. Nelken, State Board of Health, New Orleans, La., Secretary

James H. Ready, M.D., 1501 Locust St., St. Louis, Mo., Medical Director, General American Life Insurance Co.

James S. Rollins, Providence Rd., Columbia, Mo., Director, Health Education

Elton B. Scallan, St. Joseph, La., Sanitary Inspector

Gordon H. Seger, Oak Grove School, Administration Building, Flint, Mich., Health Education Director, Public Schools

Ethel L. Sherman, Box 205A, Boulder, Colo., School Nurse, Burlington Independent School District

Savilla M. Simons, 844 Rush St., Chicago, Ill., Executive Director, Douglas Smith Fund

Thelma Suggett, State Dept. of Education, Jefferson City, Mo., Supervisor of School Health Education

Public Health Nursing Section

Eunice R. Anderson, R.N., Box 145, Palmer, Alaska, Public Health Nurse, Maternal and Child Health Division, Territorial Dept. of Health

Eddy L. Coleman, R.N., Box 474, St. Joseph, La., Public Health Nurse, State Board of Health

Irene Courter, 1600 Clay St., Topeka, Kans., Staff Nurse, Board of Health

Elsie Crosby, State Dept. of Health, Atlanta, Ga., Assistant Director, Division of Public Health Nursing

Mary A. Dean, Tensas Parish Health Unit, St. Joseph, La., Public Health Nurse

Dorothy Deane, R.N., Richland, Mo., Public Health Nurse, Pulaski County

Vivian A. DeLaune, Napoleonville, La., Advisory Nurse, Bureau of Parish Health Administration

Clara W. Dewhirst, C.P.H., Bolivar, Mo., Polk County Public Health Nurse

Mabel L. Francis, 313 Civil Court Building, New Orleans, La., District Midwife Supervisor, Bureau of Parish Health Administration

Clara V. Hahn, 4301 North Ave., Richmond, Va., Director, Public Health Nursing Course, Medical College of Virginia

Mabel Hammarlund, R.N., 115 N. Elmwood, Topeka, Kans., Contagion Nurse, Board of Health

Raphael E. Heyburn, C.P.H., 3637 Broadway, Kansas City, Mo., Supervisor, Jackson County Health Dept.

Louise Kincaid, State Board of Health, Jacksonville, Fla., State Maternal and Child Welfare Nurse

Alice Kirby, R.N., 808 N. 10 St., Kansas City, Kans., Venereal Disease Nurse, Health Dept.

Nell M. Landry, R.N., Napoleonville, La., Nurse, Assumption Parish Health Unit

Elvena D. Laurent, Lake Providence, La., Public Health Nurse, East Carroll Parish Health Unit

Myrtle W. Martin, Civil Courts Building, New Orleans, La., Supervisor and Historian, Traveling Chest Clinic, Division of Tuberculosis Control, Bureau of Parish Health Administration

Minnie McEvoy, 1221 Quindaro Blvd., Kansas City, Kans., Chief Nurse, Health Dept.

Herma W. McMahon, 721 Maine St., Lawrence, Kans., Red Cross Public Health Nurse, Douglas County

Marie M. Meyer, R.N., District Health Office, Cameron, Mo., Public Health Nurse

Anna E. Miser, R.N., 1101 Congress, Emporia, Kans., Lyon County Public Health Nurse

Marion E. S. Nicholson, R.N., 2604 Minnesota Ave., Kansas City, Kans., School Nurse, Board of Education

Anne Poore, R.N., 14 City Hall, Des Moines, Ia., Educational Director, Polk County Health Service

Rosemary Rieke, R.N., 912 Pacific, Kansas City, Kans., Staff Nurse, Board of Health

Louise Shoddan, State Dept. of Health, Oklahoma City, Okla., Advisory Nurse, Field Technical Unit

Herma T. P. Smith, Mansfield, La., Public Health Nurse, State Board of Health

Hazel Son, Kountze, Tex., Public Health Nurse, State Dept. of Health

Jessie F. Sorrells, R.N., Clinton, Ark., Public Health Nurse, State Board of Health

Bernardine E. Striegel, R.N., Welfare Div., Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y., Territorial Supervisor

Sarah A. Switzer, Wood County Health Dept., Parkersburg, W. Va., Staff Nurse

Madge Taylor, 949 College Ave., Topeka, Kans., Nurse, Health Dept.

Mildred R. Underwood, 701 Front St., Fairmont, W. Va., Mineral County Health Nurse

Epidemiology Section

Joseph Birnbaum, M.D., 260 West End Ave., New York, N. Y., Medical School Inspector, Dept. of Health

Reuben A. Brown, M.D., 223 Civil Courts Building, New Orleans, La., Director, Division of Tuberculosis Control, State Dept. of Health

Alwin M. Clarkson, M.D., C.P.H., State Dept. of Health, Austin, Tex., Director, Venereal Disease Control

John R. Heller, Jr., M.D., U. S. Marine Hospital, New Orleans, La., Passed Assistant Surgeon, U. S. Public Health Service
 Thaddeus M. Koppa, M.D., C.P.H., 1015 E. 21 St., Cheyenne, Wyo., Director, Division of Epidemiology, State Board of Health
 Raymond G. Plummer, M.D., Franklin County Tuberculosis Hospital, Columbus, O., Assistant Superintendent
 Helen A. Tate, R.N., Box 175, Pauls Valley, Okla., District Nurse

Unaffiliated

Malcolm O. Austin, M.D., 605 Market St., San Francisco, Calif., Medical Director, West Coast Life Insurance Co.

William E. Braisted, M.D., College of Chinese Cultural Studies, Peiping, China
 Benjamin F. Byrd, M.D., 303-7 Ave. N., Nashville, Tenn., Assistant Medical Director, National Life and Accident Insurance Co.
 Alexander H. Jones, Central Experimental Farm, Ottawa, Ont., Canada, Graduate Assistant in Bacteriology, Division of Bacteriology, Dept. of Agriculture
 Douglas A. Meredith, D.D.S., 314 Brotherhood Bldg., Kansas City, Kans., Dentist, Health Dept.
 Alexander E. Murphy, D.D.S., 526 E. Capitol Ave., Jefferson City, Mo., Dentist, State Dept. of Health
 Howard Workman, M.D., Hermann, Mo.

CORRECTED IDENTIFICATION OF MOSQUITO IN CHINA CLIPPER

IN our issue of September, 1938, page 1117, we stated that "In August, 1937, a living *Anopheles maculipennis* was found in a Chinese Clipper arriving at Honolulu from Alameda, Calif." This was taken from an official report by Surgeon General Hugh S. Cumming to the Permanent Committee of the Office International d'Hygiene Publique

in March, 1938. We have just received a letter from Harold Farnsworth Gray, Engineer and Executive Officer of the Alameda County Mosquito Abatement District, Oakland, Calif., saying that this specimen was sent to the National Museum in Washington, D. C., and authoritatively identified as being *Theobaldia incidens*.

PUBLICATION NEEDED

THE Association stock of the January, 1938, issue of the *American Journal of Public Health* is exhausted. The Association office will gladly

pay postage on any copies which members or subscribers can supply. Address: 50 West 50th Street, New York, N. Y.

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Nurse Placement Service, 8 South Michigan Avenue, Chicago, Ill., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS WANTED

HEALTH OFFICERS

Physician, M.D., Class A medical school; M.P.H., Harvard School of Public Health; extensive experience in pediatrics and school medical services; also background of county health administration and teaching in medical school, will consider expanded opportunity in teaching or research. A302

Physician, with Dr.P.H. degree from Yale, now employed by state department of health, will consider position in general health administration, in infant welfare or in epidemiology. A300

Experienced physician, administrator, epidemiologist and teacher, now employed, with C.P.H. from Johns Hopkins, and 14 years' public health background, will consider position. Prefers epidemiology in city or state department. Excellent references. A355

Physician, M.D., University of Virginia; excellent background, seeks position as health officer in well organized health department. A388

Physician, M.D., Class A medical school; M.S.P.H., University of Michigan, 1937; now serving as district state health officer, seeks full-time administrative position in city or county. A367

Physician, experienced in health administration of cities and states, will consider attractive opening in maternal and child health or health education. A343

Well qualified physician, with C.P.H. from Johns Hopkins; experienced as school physician and in college teaching, will consider city or county administrative position or teaching and student health service. A383

Physician, M.D., University of Cincinnati; with post-graduate training in venereal disease control, Johns Hopkins; now employed, is available as venereal disease control officer. A363

Physician, M.D., C.P.H., two years' experience as district health officer; anxious to

do venereal disease control work or epidemiology. A345

Physician, M.D., A.B., 30 years city health department. Administrative, educational and research experience; also familiar with venereal disease work. A295

Physician, age 34; M.D., University of Wisconsin; M.P.H., Harvard; specializing in industrial hygiene, will consider general administration. A342

Physician with Dr.P.H. degree, experienced as a local health officer, in present position since 1929, will consider opening. A386

HEALTH EDUCATION

Well qualified woman in health education wishes position as health coördinator or health counselor. Has wide experience, and Ph.D. from New York University. H236

Young woman, M.A., Health Education, Teachers College, Columbia University; with splendid international experience, seeks position as director of health education with preference for New York City. H369

Young woman, M.S.P.H., University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. H303

Woman, M.D., Boston University; special work Columbia and Massachusetts Institute of Technology; one year's experience in state hospital; interested in psychiatry, desires position in the east in hospital for mental diseases or industrial school. H247

MATERNAL AND CHILD HEALTH

Woman physician, graduate of University of Iowa, who has directed state bureau of maternal and child health, now employed, will consider another position. C318

Woman physician, with excellent medical training and background of public health nursing experience, seeks position in maternity and infancy work. C376

(Continued on page 1364)

LABORATORY

Bacteriologist and pathologist with wide administrative experience; Ph.D., Brown University; will consider leading position in this field. L371

Experienced laboratory director with background of dairy products manufacture and research in control methods; University of Wisconsin, M.S. and Ph.D.; desires administrative position with food manufacturing or processing industry, or association with health department doing routine and research work in food control. L381

Capable research worker, Ph.D., trained at University of Southern California, seeks position directing laboratory, in research work or field investigation. Has taught bacteriology, directed state hygienic laboratory and hospital laboratories. L315

Young woman, A.B., Bates College; several years' experience in various state laboratories, desires position as bacteriologist. L253

Bacteriologist with training at C. C. N. Y., N. Y. U. and Cornell Medical College, wishes laboratory position in bacteriology; east or southwest. M351

Young woman, A.B., major in bacteriology; nine years' experience; now employed in a clinical laboratory; desires position in bacteriology or serology in a health department laboratory or in research. L382

Laboratory technician; B.Sc. degree; with experience in Army, state public health laboratory, and U. S. Public Health Service field laboratory, seeks position in medical school or university. L379

Bacteriologist and serologist, A.B., University of Kansas; at present bacteriologist in charge, public health laboratory; will consider another position. L390

SANITARY ENGINEERING

Graduate sanitary engineer with service under U.S.P.H.S. and state departments of health, especially interested in filtration plant design and operation and shellfish sanitation, seeks employment. E356

Sanitary Engineer, courses at Rutgers University, with 17 years' experience in design, research and construction of water and sewage plants, as well as aerial pollution surveys, desires position, preferably research. E321

Public health engineer, B.S. in Sanitary Engineering from Massachusetts Institute of Technology, experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. E380

Experienced sanitary engineer, graduate of Massachusetts Institute of Technology, seeks responsible position. E372

MISCELLANEOUS

Young man, age 27, S.B., Massachusetts Institute of Technology; A.M., Boston University; M.S. in Biochemistry, University of Michigan; 2 years' graduate work in public health; experienced in chemical, bacteriological and biochemical research; teaching experience in college hygiene, desires a position in a food industry involving research or control. M374

Physician, graduate of Johns Hopkins Medical School, and well qualified in medicine and tuberculosis, will consider a clinical position in the medical field. M377

Experienced teacher in bacteriology and public health, Ph.D., Cornell; now professor in Grade A medical school, will consider teaching, executive or administrative position. M327

Young woman, B.S. in Education, University of Pennsylvania; four years' experience in medical and vital statistical research; knowledge of typing and shorthand, desires position as statistical research assistant. Excellent references. S389

Dentist, graduate of Temple University, with excellent post-graduate experience, desires position in administrative aspects of dental hygiene. M352

Experienced public health nurse executive, Fellow A.P.H.A., is available for responsible position. N384

NEWS FROM THE FIELD

PUBLIC HEALTH FELLOWSHIP FOR WOMEN

THE American Association of University Women announces a public health fellowship for women.

The Mary Pemberton Nourse Memorial Fellowship in Public Health, of the value of \$1,250, will be awarded for the academic year 1939-1940. Applications for this fellowship are due on December 15, 1938.

Women applying for the fellowship must possess a bachelor's degree or its equivalent. They must also have completed a minimum of either two years of graduate study tending toward public health work (for instance in such subjects as biology, chemistry, the medical sciences, economics, sociology), or two years of practical work in the field of public health. Preference will be given to those candidates who have completed two years of residence work for the doctorate or who have already received the degree.

The fellowship may be used for any work along the lines of public health work which shall be approved by the committee.

In the letter of application, the applicant for this fellowship must explain fully her conception of public health work. Correspondence should be addressed to: Secretary, Committee on Fellowship Awards, American Association of University Women, 1634 I Street, N.W., Washington, D. C.

NURSING INFORMATION BUREAU

THE Nursing Information Bureau of the American Nurses' Association, 50 West 50th Street, New York, N. Y., has issued two folders entitled "Wanted—A Real Nurse, an R.N.," and "Safe Nursing Care and Where

To Ask for it." They discuss briefly the significance of the term "Registered Nurse" and suggest how to secure professional or other types of nursing service when needed. Any one may secure these folders from the Nursing Information Bureau.

NEW DEPARTMENT IN LOYOLA

EARL E. Kleinschmidt, M.D., Dr.P.H., the Director of the Department of Preventive Medicine, Public Health and Bacteriology at Loyola University School of Medicine, Chicago, has announced the establishment of a new Department offering courses leading to the Certificate and Bachelor of Science degree in Public Health Nursing, the Master's degree in Public Health for graduate students, courses in Preventive Medicine for medical students, and advanced Bacteriology. Associated with Dr. Kleinschmidt in the department will be John H. Bailey, M.D., recently with the University of Illinois Medical School; Dr. Klimek from the University of Michigan; Dr. Robert Lee, Associate in charge of Student Health Service; Margaret Cleary, and Mrs. M. Roessler, in charge of Public Health Nursing.

VOLUNTEER BLOOD DONORS BUREAU

THE Baltimore Red Cross has undertaken the establishment of a Transfusion Bureau aimed to supplement other facilities in the community and to supply the deficit in the transfusion requirements through the volunteer services of donors.

An outline of the provisions set up for Baltimore can be secured from Charles C. W. Judd, Director of the Blood Transfusion Bureau, 202 Guilford Avenue, Baltimore, Md.

PERSONALS

Central States

HARRY V. GIBSON, M.D.,† Health of the Eau Claire, Wis., County Health Unit, has been appointed Health Officer of Great Falls and Cascade County, Mont.

MINA B. GLASIER, M.D.,† of Bloomington, Wis., recently resigned as a member of the Wisconsin State Board of Health after 14 years of service. She served as President of the Board in 1935 and as Vice-President in 1937.

PERCY L. HARRIS, M.D.,† of Columbus, Ohio, a member of the staff of the Ohio State Department of Health, has been appointed Health Commissioner of Portage County, succeeding DR. ROLLIN D. WORDEN, resigned.

MILTON E. PARKER,* of the Beatrice Creamery Company, Chicago, Ill., has been appointed Director of the American Dairy Science Association for 3 years.

DR. HERMAN M. SOLOWAY, of Chicago, has been appointed Venereal Disease Control Officer of the Illinois State Department of Health. The newly created post was made possible by funds allotted to the state by the U. S. Public Health Service.

DR. ROLLIN D. WORDEN, of Ravenna, Ohio, resigned September 1 as Health Commissioner of Portage County.

Eastern States

THOMAS FRANCIS, JR., M.D.,† of the International Health Division of the Rockefeller Foundation in charge of research on influenza, has been appointed Professor of Bacteriology in the New York University College of Medicine.

DR. WILLIAM SHERMAN RANDALL has been appointed Health Officer of Shelton, Conn., to complete the un-

expired term of the late DR. J. EUGENE BLACK.

Southern States

CHARLES H. BONDURANT, M.D.,† of Wytheville, Va., has been made Health Officer of Wythe County.

DR. LUTHER A. BRENDLE, of Clinton, Tenn., has been appointed Health Officer of Dodge County, succeeding DR. JOHNNIE L. GALLEMORE, of Eastman, resigned.

EDWIN CAMERON, M.D.,† of Baltimore, Md., has been appointed Health Officer of Monongalia County.

ROBERT L. CHERRY, M.D., C.P.H.,† of Kaufman, Tex., Director of the District 3 Health Unit of the Texas State Department of Health, has been appointed Health Officer of the Tyler-Smith County Health Unit, to succeed AUSTIN E. HILL, M.D.,† of Tyler.

CHADWICK W. CHRISTINE, M.D.,† of Louisville, Ky., has been appointed Health Officer of Mason County to succeed OLLIE M. GOODLOE, M.D., C.P.H.,† resigned.

ROBERT P. COOKE, M.D.,† of Lexington, Va., continues as Health Officer in the health unit formed as a result of the recent separation of Rockbridge County from the Alleghany-Botetourt-Rockbridge Health District to be joined in one unit with the City of Lexington.

DR. DAVID M. COWGILL,* of Madisonville, Tenn., Health Officer of Monroe County, has been appointed Director of the Giles County Health Unit, succeeding J. W. ERWIN, M.D.,† of Pulaski, who has been appointed in Washington County.

JAMES NICHOLAS DUDLEY, M.D.,† formerly of Eastville, Va., has been appointed Health Officer for the Farmville district, made up of Prince

* Fellow A.P.H.A.

† Member A.P.H.A.

Edward, Buckingham, and Nottoway Counties.

WILLIAM Y. GARRETT, M.D.,† of Raven, Va., has succeeded JAMES NICHOLAS DUDLEY, M.D.,† as Health Officer of Northampton County.

OLLIE M. GOODLOE, M.D., C.P.H.,† of Maysville, Ky., has resigned as Health Officer of Mason County, to become Field Director of the State Board of Health for Eastern Kentucky, with headquarters in Lexington.

JAMES H. GORDON, M.D.,† of Covington, Va., has been appointed Health Officer of the new district of Alleghany and Botetourt Counties.

DR. FERDINAND R. HASSLER, JR., formerly of Oklahoma City, Okla., has been appointed Director of a new city and county health unit in Muskogee and Muskogee County.

AUSTIN E. HILL, M.D.,† of Tyler, Tex., has been appointed Director of Communicable Diseases, Epidemiology, and Maternal and Child Health in the Health Department of Houston.

JAMES O. HOOD, M.D.,† of Norman, Okla., has been appointed Health Officer of Cleveland County to succeed GUY H. WILLIAMS, M.D.

ROBERT L. HUNTER, M.D.,† of Whitesville, W. Va., Health Officer of Boone County, has been placed in charge of a new Coal River District that includes Boone and Lincoln Counties.

DR. ROBERT R. KING, of Boone, N. C., has been appointed District Health Officer in a new district made up of Ashe, Alleghany, and Watauga Counties.

BOLIVAR J. LLOYD, M.D.,† of Washington, D. C., Medical Director, U. S. Public Health Service, retired, has been appointed Director of a recently organized health unit for Austin, and Travis County, Tex.

OTIS R. LYNCH, M.D.,† of Brandenburg, Ky., has resigned as Health

Officer of Meade County, to enter private practice in Marengo, Ind.

HUGH C. McREE, M.D.,† formerly Health Officer of Lee County and recently engaged in special work under the supervision of the Bureau of Preventable Diseases of the Alabama State Department of Health, has been appointed Health Officer of Marion County, effective September 15, succeeding THOMAS L. OWINGS, M.D., of Hamilton, resigned.

BENJAMIN O. MORRISON, M.D.,† of Abbeville, La., has been appointed Health Officer of Acadia Parish.

DR. WILLIAM BRUCE NELSON, of Fairfield, Ala., has been appointed Health Officer of Baldwin County, to succeed DR. ARTHUR J. VANDERGRIND, of Bay Minette, who has resigned to accept a commission in the U. S. Army Medical Corps.

BENJAMIN M. PRIMER, M.D.,* recently Health Officer of Amarillo, and Potter County, Tex., has been made Assistant to the Director of a recently organized health unit for Austin, and Travis County.

DR. EUGENE BOWIE SHEPHERD, of Baltimore, Md., has been appointed Assistant Health Officer of Pittsylvania County, Va.

DR. CLARENCE H. WHITE, of Burnsville, N. C., District Health Officer for Avery, Watauga, Yancey and Mitchell Counties, has been appointed Health Officer of a new unit in Catawba County.

Western States

DR. JACKSON L. SADLER, of Denver, Colo., Assistant Director of the Maternal and Child Health Division of the Colorado State Board of Health, has resigned to enter private practice in Fort Collins.

* Fellow A.P.H.A.

† Member A.P.H.A.

Canada

DR. RANDOLPH J. GIBBONS, formerly Assistant to the Director of the Connaught Laboratories, University of British Columbia, Vancouver, has been appointed Chief Bacteriologist to the Laboratory of Hygiene, Department of Pensions and National Health.

DR. PIO H. LAPORTE, of Edmundston, has been appointed Minister of Health and Labor in the Government of New Brunswick.

DR. JOHN W. MCINTOSH,† Medical Officer of Health of Vancouver, B. C., retired from that position September 30.

Puerto Rico

EDUARDO GARRIDO-MORALES, M.D., DR.P.H.,* of San Juan, has been re-appointed Commissioner of Health of Puerto Rico for a term of 4 years.

DEATHS

HENRY MARTYN BRACKEN, M.D., Secretary and Executive Officer of the Minnesota State Board of Health from January 12, 1897, to September 1, 1919, died September 25, 1938, at his home in Claremont, Calif., in his 85th year. Upon retirement as State Health Officer, in 1919, Dr. Bracken was commissioned in the Reserve Corps of the U. S. Public Health Service as Surgeon, with rank equivalent to that of Lieutenant Colonel in the Army, and assigned to the Veterans' Bureau. In 1923 he resigned and moved to California, where he was actively engaged in public health work in Los Angeles City and County.

FRANK W. LAIDLAW, M.D.,* of Middletown, N. Y., District Health Director and Dean of the New York State Department of Health field personnel, died September 20. For over 20 years, Dr. Laidlaw was District

Health Officer with jurisdiction over the Middletown district involving general supervision of the work of more than 70 health officers. At the time of his death, he had direct supervision of Sullivan, Orange, and Rockland Counties and of the sub-district composed of Ulster and Greene Counties. Since 1936, when he was promoted to the position of District Health Director, he had had in addition general supervisory jurisdiction over the districts in the eastern upstate area.

ERNEST COLEMAN LEVY, M.D.,* of Richmond, Va., died September 29, at the age of 70. Dr. Levy was formerly Chief Health Officer, and later Director of Public Welfare, of Richmond. For 3 years he was Health Officer of Tampa, Fla. Dr. Levy served as House Physician at Mount Sinai Hospital in New York from 1890 to 1892, and from 1897 to 1900 was a Professor at the Medical College of Virginia. At the same time he was Editor of *The Medical Register*. In 1925 he returned to the Medical College of Virginia to teach preventive medicine. During the World War he made original investigations in the origin of Southern typhoid fever, and was known for his study of the breeding and control of the house-fly, which resulted in the invention in 1911 of the maggot trap. He had also conducted research in infantile diarrhea. He was President of the American Public Health Association in 1923.

RICHARD M. OLIN,* Director of Health Service, Michigan State College, East Lansing, Mich., died October 4. He became a member of the American Public Health Association in 1915, and a Charter Fellow in 1922.

* Fellow A.P.H.A.

† Member A.P.H.A.

American Journal of Public Health and THE NATION'S HEALTH

Volume 28

December, 1938

Number 12

A Century in Arrears^{*}

ABEL WOLMAN, DR.ENG., F.A.P.H.A.

President, American Public Health Association; Professor of Sanitary Engineering, Johns Hopkins University, Baltimore, Md.

EXACTLY one hundred years ago the Poor Law Commissioners of England recommended that the Poor Law Act should be so amended as to provide for expenses which resulted from disease by which the poor were reduced to destitution. The Commissioners stated: "In general, all epidemics and all infectious diseases are attended with charges, immediate and ultimate, on the poor rates. Laborers are suddenly thrown by infectious diseases into a state of destitution, for which immediate relief must be given." They further recognized that "The amount of burdens thus produced is frequently so great as to render it good economy on the part of the administrators of the poor laws to incur charges for *preventing* the evils . . ."

Thus a century ago, as Sir John Simon accurately phrased it, "Health necessarily began to take rank as an object of practical politics." No one reading the history of English sanitary

institutions can escape the conclusion, however, that the practical acceptance of this axiom was beset with continuing difficulties. During the past century of public health progress in England and in this country the same heated contests have always been waged, as to the pace at which and the method by which the public health should be conserved. Tacit acceptance of principles has rarely if ever been paralleled with equally prompt initiation of action. The "How" and the "How Fast" of all public health procedures have always been the stumbling blocks in providing people with the full benefits of available scientific knowledge.

Since these two controlling brakes upon public and private activity characterize all advances in the public health field, it appeared profitable to your incoming President to evaluate the "friction" possibilities of these brakes in the various fields of public health activity during the next few years. How successful these devices for slowing up fruitful application of science have been during the past 100 years is probably already known to most of you. In July, 1938, the United States Govern-

^{*} Presidential Address presented before the American Public Health Association at the Sixty-seventh Annual Meeting at Kansas City, Mo., October 23, 1938.

ment semi-officially and tentatively recognized and gave position to the ancient axiom that without health there is no wealth. Although the truism is approximately centuries old, its rediscovery in this country 100 years after its revival of recognition in England is important if it will carry us over "the ridge of the hill" to successful initiation of universal public health service. If, however, the rediscovery of an old and accepted principle is to lead to crimination and recrimination, to emphasis upon terminology, to confused battling about communism, local autonomy, dictatorships, local and central responsibility, and other important but not always relevant symbols of the times, then another century may pass before true and realistic acceptance of the principles of 1838 is to bear fruit.

Competent political scientists will no doubt point out that 100 years represent a short time in the evolution of technics of government. And if we use the historians' device of compressing the time scale perhaps a million fold, then it was only an hour ago that the Poor Law Commissioners emphasized the economic importance of disease and insisted that provision be made in the poor laws for the recognition of this fact. It was less than a second ago, too, that one of our most authoritative national associations gave official recognition to similar axiomatic principles.

To those impatient to provide the indigent and the middle class with adequate medical service and satisfactory hospitalization, and communities an opportunity to attain a reasonable level of public health service, the answer that the concept, without health there is no wealth, was recognized geologically only a few minutes ago, offers little solace and really no practical advantage. Philosophically we may believe that time will cure all evils, but in current operations "When" and "How" must become controlling issues for all of us.

THE FIELDS OF ACTION

It is generally agreed that the nation's health is in an unsatisfactory condition. It is probably further agreed that the primary causes of this unsatisfactory situation may be encompassed in something like the following four major defects:

1. The poor environment in which the great mass of the population is living and the inadequate control, even at this date, of the physical environment of the people
2. A relatively incomplete dietary
3. Defects in the organization of public health and medical services
4. Gaps in the knowledge of the causation and prevention of disease, and imperfect application of such knowledge as is available

The elimination or correction of the defects enumerated above by the sudden arrival of an economic millennium appeals to the imagination only at first thought. A keen observer of the American scene remarked at the National Health Conference in Washington, that "the fundamental needs of mankind are food, fuel, clothing, shelter, and a job, and medical care and dental care must always be subservient to those main human needs. Let us concern ourselves first with that question of food, fuel, clothing, shelter, and a job with adequate wages." He was stating only a half truth in the enthusiasm of the attack of the moment. No one doubts that the abolition of poverty and the complete institution of sanitary methods and immunization will still leave much ill health and disease with the rich and with the poor. Economic improvement is devoutly to be prayed for. It may be prophesied, however, that there will still be with us the malignant tumors, the appendicitises, the gastric ulcers, the chronic rheumatisms, the diseases of the cardiovascular system and of the kidneys, the diabetes, and others, which will continue to plague mankind, rich or poor, and will still demand public health and

hospital service and the family doctor in the future as at present.

Since the economic millennium is still around the corner and is not due for imminent arrival, much still remains for the public health officer and physician to do. Let us review briefly the fields of action which must confront the country during the next few years. In which of these should our maximum efforts be concentrated, and to which can this Association make its most valuable and prompt contribution?

ENVIRONMENT AND FOOD SUPPLY

Fortunately no one seriously controverts the desirability of maintaining and developing the environmental protective services directed toward general sanitation, pure water and food supply, good housing, and the control of infectious diseases. Great amounts of work remain to be done in the entire field of environmental sanitation. Millions of homes of inadequate character must be replaced. Little if anything has been done to deal with the evils of atmospheric smoke pollution. Noise increases while knowledge regarding its correction and its effects remains limited. Although thousands of bodies, official and private, exist for the control and distribution of supplies of water and the elimination of sewage, no national plan of comprehensive character has yet been completely formulated. In the field of industrial hygiene opportunities of incalculable extent lie untouched for the engineer, the physician, the nurse, and the chemist.

Man accepts the importance of these activities, however, because upon their successful accomplishment civilization rests. Argument may continue as to method and as to cost, but few if any are ready to eliminate or to fail to extend those services without which no modern community can survive. I give little time to it this evening, not because of its lesser importance, but because of

its universal and better recognition by both professional and layman.

Similar reflections may properly be made with respect to raising the level of food consumption and of improving dietary deficiencies of the population both young and old. Here, too, debate has moved from the realm of "How fast" to the "How," within the limits of existing scientific information. No acrimonious debate meets the proposal that children should be furnished with an adequate amount of properly balanced foods. The debate centers, rather, upon the procedure of obtaining the foods and of educating the public to their intelligent use.

DEFECTS IN THE ORGANIZATION OF THE PUBLIC HEALTH AND MEDICAL SERVICES

The key to the problem of the organization of public health and medical services lies in the simple fact that, "notwithstanding great advances in medicine and public health protection, the American people are not so healthy as they have a right to be." Statistical demonstration of this fact is by this time reasonably agreed upon. At least no important criticism of this particular phase has appeared on the public health horizon. Almost everybody agrees that millions of American people are suffering from disease and that probably over a hundred thousand of them die each year from preventable causes.

Some three years ago the late Edgar Sydenstricker summarized these facts perhaps more dramatically than has since been done. I am taking the liberty of referring in some detail to one of his last public addresses in 1935. He then said:

The ravages of typhoid fever, diphtheria, and smallpox have been enormously lessened; they ought to be and can be eradicated. The infant death rate has been cut in half in the last quarter century, but it can again be cut

in half. Mortality from tuberculosis has been reduced by 60 per cent since 1900, and could be halved again. Two-thirds of the annual thirteen thousand maternal deaths are unnecessary. At least three-fourths of a million cases of syphilis are clinically recognized annually, but more than half of these do not obtain treatment at that stage of the disease when the possibility of cure is greatest. We have been rather vociferous in recent years over the health and welfare of children; yet it is estimated that 300,000 are crippled, a million or more are tuberculous, and nearly half a million have heart damages or defects.

The mortality of adults of middle or older ages has not appreciably diminished. The expectation of length of life at forty is about the same now as it was in 1850, 1890, or 1900. The mortality of adults who should be in their physical prime—20–44 years of age—is almost as great as that of the younger group, which includes babies and children. The mortality of persons who ought to be in full mental vigor and still capable of many kinds of physical work is over three times that of the younger adults. In the young adult ages—20–34 years—tuberculosis still tops the list as a disease; accidents and homicides snuff out about one life in a thousand annually; organic heart disease appears in even this young age period as the third most important cause of death. All careful studies of illness and physical impairments corroborate these ghastly records; in fact, they reveal even more impressively than mortality statistics the extent to which the vitality of the population is damaged in the most efficient period of life. This disconcerting evidence of impaired efficiency among our adult population takes on a graver significance in view of the changing age of our adult population. We can no longer squander the vitality of our grown men and women. The task of health conservation in the future must be broadened to include adults as well as children.

This appalling indictment of the state of the health of the Union is unfortunately only part of the story. The findings of the Interdepartmental Committee of the United States Government extend this indictment in even more distressing terms. Only a few of the more important conclusions of this committee are here presented. They round out one of the most serious and comprehensive attacks on our national public health deficiencies which have

been made available in the history of this country. Their disclosures—still uncontroverted—show that even today, generations after Disraeli, the first statesman to demand it, public health has not yet been made the first concern of the State. If anything, it remains a tenth-rate power in the competition for position in the governmental sun. Some of these findings are listed briefly below:

a. Fifty million Americans are in families receiving less than \$1,000 income a year.

b. For the ten most deadly diseases, the death rate is almost twice as high among unskilled workers as among professional workers.

c. The gross sickness and mortality rates of the poor of our large cities are as high today as they were for the nation as a whole half a century ago.

d. No physicians' care is received in 28 per cent of seriously disabling illness among the belt of normally self-sustaining families just above the relief level.

e. In the case of disabling illness lasting a week or more, one person out of four receives no medical care whatever among 20 million people in the relief groups, or among the 20 million people above that level who can purchase it only at risk of curtailing food, clothing, shelter or other essentials of health and decency.

f. Over 40 per cent of the counties in the United States do not contain a registered general hospital to serve their total of 17 million people.

g. There are counties in the United States where for a 5 year period there were no maternal deaths; there are others where the maternal death rate is more than 200 for each 10,000 children born.

h. In 1936, nearly a quarter of a million women did not have the advantage of a physician's care at the time of delivery.

i. For the great majority of the million births attended each year in the home by a physician, there is no qualified nurse to aid in caring for mother and baby.

j. One-third of the 35 million children under 15 years of age in the United States belong in families able to pay but little for medical care.

k. Every year 70 million sick persons lose more than one billion days from work.

l. Workers in industry have a life expectancy approximately 8 years less than non-industrial workers.

m. For respiratory tuberculosis, the death rate among unskilled workers is seven times as high as for professional workers.

n. In twenty-seven iron and steel towns, the death rate from pneumonia is two-thirds greater than in the United States as a whole.

o. A million workers are exposed to the hazards of silicosis.

p. Health supervision is inadequate in most industrial plants employing 500 or less workers, yet these represent some 62 per cent of the working population.

q. On the average day of the year, there are 4 million or more persons who are temporarily or permanently disabled by illness--unable to work, attend school, or pursue their customary activities.

r. Among gainful workers, there are on the average probably 7 to 10 days of sickness disability--in the course of a year--but these disabilities range from a day, a month, a year, to a lifetime.

CONTROLLING PRINCIPLES AND PROGRAM

Since no one has seriously challenged the statements of need so far presented, we may profitably pass to the more important controlling principles of action which should result from the statements of need. Fortunately, within a few seconds, upon the basis of the Gargantuan calendar of geologic time, equally universal agreement has apparently been reached in the United States on the controlling principles of action. Even at the risk of minor error, these agreed principles are re-stated here in the briefest possible terms. They are:

1. The extension and modernization of public health services.

2. The strengthening of attack upon four great threats to life: tuberculosis, venereal diseases, malaria and certain occupational hazards.

3. The reduction of deaths from pneumonia and cancer.

4. The reduction of morbidity from mental disorders.

5. The expansion of maternal and child health services.

6. The expansion of general hospital facilities where need exists and the extension of the use of existing hospital facilities.

7. The recognition of the principle that

the complete medical care of the indigent is a responsibility of the community, medical and allied professions, and that such care should be organized by local governmental units, supported by tax funds and stimulated and coördinated by the federal government.

8. The provision of minimum medical services to 20 million additional people close to the emergency level.

9. The rôle of the federal government should be principally that of giving financial and technical aid to the states in their development of sound programs through procedures largely of their own choice.

10. The extension of the principle of hospital service insurance.

11. The development of voluntary or compulsory health insurance to meet the costs of emergency or prolonged illness.

12. The development of programs of insurance against loss of wages during sickness.

13. The further development of our public health and medical service should rest largely upon the members of the medical profession.

COST

The cost of accomplishing these objectives is in the neighborhood of \$850,000,000 annually. Today, the people of the United States expend approximately $3\frac{1}{4}$ billion dollars annually for health services. The individuals pay approximately 80 per cent of this cost direct, while government pays 16, philanthropy 2, and industry 2 per cent. The new program, therefore, based upon an agreed platform, need not entail additional expenditures by the people of the United States. They require, on the contrary, a more intelligent and logical completion, unification, and coördination of health and medical services upon a nation-wide base. These in turn will require new channels for old expenditures, with new objectives re-defined and strengthened by public, private, and voluntary action.

THE RÔLE OF THE A.P.H.A.

For the first time in our history, therefore, all forces have agreed upon an expansion of public health and medical activity, upon the principles which should control it, and upon the probable

costs involved. This general agreement, however, by no means eliminates the necessity for hard thinking. What we like to call the details of execution and of administration, in this sphere of action as in others, still remain the rocks upon which the program may founder.

Public health now enters seriously for the first time the field of competition with other governmental activities. We want it to become a "first rate power" whose aim, unlike that of some other "first rate powers," is to save rather than to destroy lives. If it succeeds it becomes at once a competitor of the ancient and powerful consumers of public and private funds—armaments, highways, flood control, navigation, general education, etc. What position should the advocates of public health expansion take in this competition for public funds? How should this field of endeavor be adequately integrated with other important and necessary spheres of governmental activity?

In the second place, what balance of power, both in initiation and in current administration, should be maintained between local and central government? What shall be the relationship of private medical practice to public health service? Rigid attention to the detail of safeguarding the quality not only of medical service but of general public health service, is essential if we are to avoid the crystallization into "accepted practice" of the less efficient methods of present practice or even an increase of the total amount of illness of real or imagined character.

The obvious economic risks attached to various forms of compulsory health insurance should not be lost sight of and certainly should be made the subject of rigid economic inquiry.

The sheer problem of integration of various public and private forces is one to give us all pause, but it should

be remembered that many of these problems assume immeasurable difficulties on paper, while their administration in fact goes on around us. One observer has already pointed out, for example, that if one were to list the necessary governmental and private activities essential for daily existence on Manhattan Island, he would be forced to conclude that such an organization of society is too complicated for successful accomplishment. The fact remains, however, that Manhattan Island lives successfully and regularly and with low death rates and other amenities which may well match or surpass those of the simplest village of 200 persons.

We should not permit our fears of difficult and complicated administrative action, therefore, to sap the courage necessary to embark upon a new program of advantage to the people of this country if the facts justify the desire. This road to new accomplishment may properly be travelled with the past fresh in mind, namely, that the methods of central governmental control may not always turn out to be the short and ready road to desirable reforms. But neither should these methods always be interpreted as leading directly and rapidly to the devil. The essential condition for effective local government lies in the force of local intelligence and will. In the creation of that force a wise and stimulating central government may play an important if not dominant rôle. No one discounts the difficult problem experienced by a Chadwick a hundred years ago of finding in local government politics the happy mean between the "too much" and the "too little" of central interference. While we are on that search it cannot be forgotten that the people must be served with the most intelligent use of the tools at hand. Offering a protest and nothing more may demonstrate a "liberal temperament," but a plan is essential to satisfy a people.

Your incoming President assumes that the American Public Health Association unites in a protest against inadequate service, agrees on a plan and will take a position promptly in crystallizing the details of that plan and in contributing its advice to the development of a structure permanently designed to supply the people of this country with reasonably adequate public health, medical and hospital service. To implement these purposes, the speaker tonight proposes that the Association undertake a series of duties which will demonstrate its faith in the plan and its desire to prove its workability. These proposals for action are:

1. That the Association adopt in principle the concept of public health responsibility set forth by Sydenstricker in the following terms:

"Society has a basic responsibility for assuring, to all of its members, healthful conditions of housing and living, a reasonable degree of economic security, proper facilities for curative and preventive medicine and adequate medical care—in fact, the control, so far as means are known to science, of all of the environmental factors that affect physical and mental well-being."

2. That the Executive Board appoint a committee of seven of the outstanding leaders of thought in the Association to cooperate during the coming year with the Inter-Departmental Committee of the United States Government, with the American Medical Association, and with the Conference of State and Territorial Health Officers, to study and agree upon a practicable plan for putting into effect without delay the major recommendations presented at the National Health Conference of 1938.

3. That the Executive Board develop in the immediate future,

- a. A re-statement of national health policy and of the objectives of the American Public Health Association in relation thereto.

- b. An evaluation of state and local health department organization in order to determine what future adjustments in major machinery of these institutions are essential to develop most efficiently the objectives of the National Health Policy.

- c. A plan for coordinating, unifying, and completing the agencies on a national level for the most satisfactory development of adequate health services.

- d. A study of guiding principles which should control the grant-in-aid procedure of the federal government, with particular reference to the long and varied experience of the central governments in England, Canada, Australia, and the United States.

- e. An authoritative statement on the various private and compulsory health insurance plans now available or in use which may serve as guides for experimentation in various areas of the United States.

- f. An evaluation of the relationship which public health activities should bear to other important public undertakings, such as welfare, education, and so on, so that a more reasonable balance of governmental activity may be maintained within the limits of appropriation of funds in the various areas of the country.

The Association for a great many years has made important contributions to the field of administrative practice. It has before it at this time perhaps the most important contribution which it has ever been called upon to make. It is one in which administrative standards and structures are the key stones to a successful future edifice of health administration. To this task, the Association should dedicate itself.

For many years, we have preached that "Public Health is Purchaseable." The public at last seems willing to buy it. The Association must adequately define the terms of the bill of sale so that a willing buyer, the American people, may taste more completely of the fruits of science in the promotion and maintenance of positive health.

The Health of the Nation*

THOMAS PARRAN, M.D., DR.P.H., F.A.P.H.A.

Surgeon General, U. S. Public Health Service, Washington, D. C.

IN discussing public health in the United States it is tempting to dwell upon past accomplishments. It is pleasant to point with pride to the lowest general mortality on record; to a further decline in the tuberculosis rate, now less than 50 per 100,000; to a continually lower infant mortality and a significant reduction in the mortality of women during childbirth, which is 15 per cent lower this year than last. Similar satisfaction could be taken in the low level of death rates from typhoid fever, diphtheria, and many other preventable causes. Such rates, however, are based upon past records and compared with death rates of earlier days. If medical science were static, past records would be a useful yardstick. Medical science, however, is not static. Almost every year additions are made to scientific knowledge which make it possible for us to do more than previously was possible in the prevention of disease. Many tools for better health are being forged in our scientific laboratories.

There is every reason why we should accomplish more now than in the past. Moreover, an awakening public sentiment and the increasing interest of doctors in disease prevention as well as cure, make it possible for us to do far more than has yet been done in putting medical science to work for all of the

people. Sickness and death rates of previous years, therefore, are inadequate yardsticks for the present and are utterly useless as goals for the future. Public health is a dynamic science. The horizon of knowledge is being extended year by year. Our plans for its application should embrace not only the knowledge we now have but should forecast the inevitable accretions to knowledge which year by year are making it possible to prevent deaths now considered inevitable.

The first large scale effort to shorten the lag between what we know and what we do, came in the provisions of the Social Security Act. Experience has shown that the basic plan of federal-state coöperation for health work was soundly conceived. In most states and communities it has been effectively administered. It has been possible to allot a ponderance of federal funds to those states and communities with the most meager financial resources but with the most urgent health problems. It has been possible to insist upon qualified public health personnel. The number of counties under the direction of whole-time health officers has been increased by 96 per cent. Federal funds have served to stimulate state and local appropriations. New funds from these sources exceed \$8,000,000. Vital services of state health departments have been strengthened. For the first time, a number of states have begun to provide for in-

* Read at a General Session of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

dustrial hygiene as a health activity. Emergency federal funds have provided sanitation, better water supplies, treatment of sewage, and malaria drainage. Greater progress has been made in public health during the past two years than in any similar period in our history.

One of the most important results of federal aid to health has been in the training of public health personnel. More than 3,000 health officers, nurses, laboratory directors, and other professional and technical personnel have been trained with Social Security funds.

During the past two years, also, we have seen two important additions to federal statutes relating to health. The National Cancer Institute was created by an Act of Congress last year and authorized to conduct studies relating to this disease; to promote coördination of similar studies conducted by other agencies; to procure and lend radium to research and treatment centers; to provide research fellowships and train cancer specialists; to coöperate with state health agencies in the prevention and control of cancer. The Act provides also for the useful application of research results with a view to developing the widespread use of most effective methods of prevention, diagnosis, and treatment of cancer. A building is under construction to house the Institute as a part of the National Institute of Health group, and an appropriation of \$400,000 is available this year for carrying out the purposes of the law.

For this fiscal year, funds are available to assist the campaign against venereal diseases. The Venereal Disease Control Act, passed May 24, 1938, authorizes coöperation of the states for the prevention and control of these diseases and studies by the Public Health Service to develop more effective methods. Appropriations authorized for the next fiscal year are \$5,000,000,

for the succeeding year \$7,000,000 and for the next ten years such amounts as the Congress may deem necessary to carry out the purposes of the Act.

Perhaps the most significant progress during the past two years, however, has not been in terms of legislation, nor yet in terms of actual public health accomplishment, but in the development and presentation to the country of a far-reaching national health program designed to deal in a comprehensive way with the whole problem of health and medical care.

Two years ago in "Reporting Progress" I discussed with you the health services made possible by the Social Security Act. Last year Assistant Secretary Roche in a historic address summarized the findings of the National Health Survey; documented the long known fact that the sick are poor and the poor are sick; added conclusive evidence that the poor receive the least and the least good medical care; argued convincingly that the treatment of the sick was no less a responsibility of health officers than the prevention of disease; and recommended that this Association appoint a committee to coöperate with appropriate federal agencies and the medical profession in working out national plans for the medical care of the underprivileged. Such a committee was appointed.

Three months ago under the chairmanship of Miss Roche and at the suggestion of the President, a National Health Conference was held in Washington. To that conference were presented the needs of the American people for health and medical care and definite proposals as to the several methods by which we as a nation can meet these needs.

The first recommendation was for the expansion of public health and maternal and child health services in order to minimize the risk of illness, to reduce

its current volume by expanding present federal-state coöperation under the Social Security Act. Through strengthened local health organizations it was proposed that a major attack be directed against those causes of disease and death for the control of which we have scientific weapons of unquestioned power.

To meet the great deficiencies in our physical facilities for good health it was recommended that additional hospitals, mental and general, tuberculosis sanatoria, health centers, and rural hospitals be built.

For the medically needy it was recommended that public medical care be provided for the dependent groups of the population, and for those who, although able to obtain food, shelter, and clothing from their own resources, are unable to procure necessary medical care.

To meet the economic burdens of unpredictable illness among self-supporting persons it was recommended that either general taxation, or special tax assessments, or specific insurance contributions, provide the funds. The rôle of the federal government in this respect should be properly that of giving financial and technical aid to the states in their development of sound programs of their own choice.

It was recommended also that insurance against the loss of wages during sickness be provided by an extension of existing unemployment provisions and other provisions of the Social Security Act.

It was urged that this program should be developed in an evolutionary manner over a period of ten years; that it should not be a federalized operation of health and medical care but that the federal government should use funds through grants-in-aid to assist in equalizing the financial burdens, to insure minimum standards and to give the incentive to all parts of the country

to join in a national movement. Finally, it was stated that if a more limited health program were contemplated, priority should be given to the first and second proposals.

The National Health Conference dissected the whole complicated problem of medical care into its component parts. It outlined clearly the next steps which we as a nation should take. Each of these steps is simple and understandable. It will require, however, the best professional thinking to fit all elements of the health program into a sound administrative scheme for the prevention and cure of disease; and to integrate this with our present activities at federal, state, and local levels. It is clear that we cannot continue to think in terms of the separateness of public, private, and voluntary efforts, or of the separateness of preventive and curative efforts to reduce death and disease. Each contributes to the health of the individual and the nation. All are parts of the same entity. They frequently are not smoothly functioning parts. Our job is to make them mesh.

There is every prospect that the next steps in a national health program will be taken soon. Each step will impose additional duties upon health departments in every state and community. Since there is general acceptance of the principle of unity between the prevention and treatment of disease, sound public policy dictates that there should be a unity of administration for health and medical care programs. The health department obviously is the one agency best fitted to do this job. A national health program will not be launched full grown as an emergency measure. It is deliberately planned as an evolutionary development, in some of its phases covering a ten year period. None of us knows exactly the rate of progress in developing each of its several parts. All are confident that the

basic objectives are sound. There is no serious disagreement as to method. In some sectors we must learn by careful doing in order to plan the succeeding steps efficiently.

All of these facts point to the need that the health departments in every state, city, and county prepare to assume the added responsibilities which inevitably will be theirs. This will mean the training of a larger and better health personnel skilled in the several special scientific disciplines represented in this Association. To do this job well public health must be made a career service in every state, county, and city. No effective health program can be built on the quicksands of partisan politics. Appointments must be made on merit; tenure in office must be based on accomplishment.

In support of a nation-wide program of health and medical care, there is much more public interest than anyone expected. There is much more medical interest than anybody knew existed. The majority of medical opinion in the country, as reported through the House of Delegates of the American Medical Association, is more liberal in its view of national health problems than some of their spokesmen had indicated. The top men in clinical medicine, as individuals and as represented through their special societies, always have been leaders in progressive thought. Both of these groups in their thinking seem to be a little ahead of us whose job it is to serve the public health.

Public health seems to be one of the most popular issues in the country, non-political in character, appealing to all shades of opinion. But we must remember that this popular support will be transitory and evanescent unless the health services in every community are efficiently conducted. The success of a national program will depend on how fully the needs of the people for public health and medical care are served.

From this point on, the attitude of law-makers and of the public generally will be determined by what each state and local health officer does. It is on this basis that judgments will be made and progress will be possible. Even in advance of federal action there is a mass of public feeling at the health officer's command. It is his to be used for health improvement in any county or city where he is intelligent enough to organize it.

In an earlier time the pioneers of public health were alone in the wilderness. Few among the medical profession and the general public knew what health officers were doing or why. Our job is easier now. The doctors and the public are beginning to understand the social and economic importance of your job and mine. The health officer is no longer in the front rank of public opinion. In fact, he needs to think fast and to act effectively if he is not to lag behind.

Nor is the new attitude of the American people toward public health an isolated phenomenon. During the past summer I have been studying public health and medical problems in Central and South America. As chairman of the United States delegation, I attended the Tenth Pan American Sanitary Conference held in Bogota, Colombia, during the first half of September. Pursuant to treaty provisions, every American republic was represented by official delegates. From almost every country reports were presented which told of extraordinary activity in public health and in medical care for the underprivileged. These reports were verified as I visited several of the countries themselves and observed their activities. In tuberculosis and venereal disease control, in social security measures, in national programs for better nutrition, in maternity and child health work, no less than in the control of such pestilential diseases as

yellow fever and plague, great progress is being made, even in some nations otherwise backward.

Of great significance for the purposes of our present discussion is the fact that these measures are not being imposed by central governments upon apathetic populations, but are being carried out—in some cases reluctantly—because of widespread and insistent popular demand.

Public health has become a people's cause. The people have become insistent that they be given the benefits of what scientific knowledge has verified as valuable for the prevention and relief of disease and for the maintenance of healthful living. They are entirely willing to support, also, further studies to solve those problems of health and disease which still baffle us.

The Renaissance was the great upswing from the dark ages toward art, literature, and beauty in every form. It burst forth simultaneously in a hundred cities of Europe because the people were ready for it; it was the spirit of the age.

The French Revolution was the beginning of a world-wide fight for political freedom, in which our own young

nation played its gallant part. The world movement toward beauty of form and expression seems to have leveled out. The world movement for freedom is alive only in isolated nations. But I believe that today we see the first faint stirrings of a world movement for health—a people's fight for life, for freedom from disease, for an equal opportunity to be born well and to live well.

Science has shown the way. Not only by the fruits of its labor which has saved men's lives, saved them suffering, and maintained their physical and mental fitness, but also through the orderliness of mind, the clarity of vision, and the willingness to sacrifice for truth (which are the fundamentals of the scientific spirit), it is my firm belief that man may hope to raise himself high enough in the human scale to master his own machines and to affirm his own destiny, rather than become the passive instrument of self-designated supermen.

Science has shown the way. The scientists of public health must be prepared to meet the demands of leadership. To do so may be the greatest contribution to social peace in our day.

Present Status of Dental Caries in Relation to Nutrition*

NINA SIMMONDS, Sc.D.

University of California College of Dentistry, San Francisco, Calif.

THE rôle of nutrition in the cause and prevention of dental caries is perhaps one of the most controversial topics in dental research today. Only a brief discussion of the nutritional and bacteriological aspects of the problem can be given here. Reference is frequently made to papers already published and these should be consulted for further details.

Two recent papers present the dental viewpoints on the problem. Bödecker has discussed "Classification of the Lesions of Dental Caries and Factors Affecting the Rate of Penetration of Dental Caries,"¹ and Applebaum has reviewed "The various and variable factors which have been implicated in the mechanism of caries" under the following headings: (a) Bacteria and Enamel Decalcification, (b) Food Impaction, (c) Mechanical Injury, (d) Physiologic Factors in Caries, (e) Proximal Enamel Caries, and (f) Caries in the Dentin.²

At least 4 avenues of approach to the problem of the prevention and arrest of dental caries have been suggested:

1. Prevention by Operative Procedures
2. Prevention by Proper Mastication
3. Prevention by Diet
4. Prevention by Mouth Hygiene (especially as regards certain species of bacteria among which is *L. acidophilus*)

The first two are strictly dental, so the opinions of dentists as to their relative merits will be of greatest value. The third, Prevention by Diet, will be discussed in connection with the fourth, Prevention by Mouth Hygiene. The use of the tooth brush in personal hygiene is an accepted practice so will not be considered further as a factor in reducing caries incidence.

The reason for discussing Prevention by Diet and Prevention by Mouth Hygiene together is that the data extant show that the foodstuffs comprising the diet determine in great measure the flora of the mouth. I question whether this correlation has been sufficiently emphasized in interpreting the rôle of nutrition in dental caries.

Although Boyd, Drain, and Nelson of the University of Iowa were by no means the first to associate nutrition with the prevention of tooth decay, the diet published by them in 1928 and 1929 tended to focus attention upon the Prevention by Diet viewpoint.³ The following foods plus insulin formed the basis of the daily menus of diabetic children in the University Hospital: 1 quart of milk, 1 egg, 1 serving of meat or fish, 1 orange or tomato, one additional fruit, 1 teaspoonful of cod liver oil, 6 teaspoonfuls of butter, one portion ($\frac{1}{2}$ cup) leafy vegetables (spinach, chard, greens, cabbage, etc.), one portion ($\frac{1}{2}$ cup) meaty vegetables (peas, beans, carrots, etc.).

After the children had been confined

* Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

to this diet for several weeks the observation was made that cavities in the teeth had not progressed further—tooth decay had been arrested. There is no need to detail the dietary properties of these foods; their importance in any diet (or foods containing the same dietary essentials) is too well known to warrant further comment.

For many years prior to the work of Boyd, Drain, and Nelson, Bunting and his coworkers at the University of Michigan had been interested in the dental health of children in certain orphanages in Michigan. For several years the diet of the children in one of these orphanages was admittedly below the standards accepted as normal for children as regards protein, calcium, phosphorus and vitamins, and yet during this time these children had a very low incidence of tooth decay.⁴

What is a possible explanation of this apparent paradox regarding diet and tooth decay? The facts are that two very dissimilar diets have been published, each claiming either to prevent or arrest dental caries—one obviously, adequate, and the other admittedly inadequate.

It should be stated that neither Dr. Bunting nor his coworkers ever said that this inadequate diet produced optimum growth and well-being in these children. In fact Koehne reported "that 40 per cent of the 201 children between the ages of 8 and 18 who lived in the institution for an average of 4 years were stunted in height according to the Woodbury standard."⁵

Apparently confusion arose over the following points of view which were not clearly defined:

1. Caries was arrested and prevented by a diet which stunted the growth of many of the children confined to it.

2. Caries was arrested and prevented by a diet which would induce good growth and well-being in children confined to it.

In other words, *prevention of caries*

by diet was confused with the *promotion or retardation of growth and well-being* by diet.

A comparison of the diet of the children in the orphanages with that fed by Boyd, Drain, and Nelson to the diabetic children shows that whereas the two diets vary greatly in nutritive value, especially as to minerals and vitamins, they are very much alike in one important detail—namely, they are both low in sweet foods such as jams, jellies, marmalades, cakes, cookies, candy, honey, sugar, and syrups.

The diets of diabetic children or adults contain varying amounts of carbohydrate, which comes largely from the 5 and 10 per cent fruits and vegetables with small amounts from cereals and bread and none or very little from the highly sweetened foods. The orphanage diet contained liberal amounts of cereals (starch) but in reference to sugar and other sweet foods, Dr. Jay, a coworker of Dr. Bunting, states: "Candy was strictly forbidden in the institution, sugar was never served at the table, and artificially sweetened desserts were served only on special occasions."⁶

This one detail, namely very low intake of sweet foods in both regimens, undoubtedly accounts in part at least for the observed results, low incidence of tooth decay. An appreciation of the one point of similarity in these two dissimilar diets is unquestionably a step in advance in our understanding of the problem of the rôle that sweet foods play in nutrition and the development of dental caries.⁷ In some instances apparently starchy foods may also be an etiological factor in caries. In recording data, it would be better to use the terms starches, and sugars, or to name the suspected foods, rather than to use the general term carbohydrates.

Sweet foods have been accused of causing tooth decay for many centuries. According to Pickerill, Aristotle who

lived from 384 to 322 B.C. said in his book entitled "Problems": "Why do figs when they are soft and sweet produce damage to the teeth? Perhaps the viscous softness of the fig causes small particles to adhere to the gums and insinuate themselves into the dental interstices where they very easily become the cause of putrefactive processes."⁸ If the term putrefactive were changed to fermentative the statement would sound very modern. Weinberger quotes the following from *A Treatise on the Teeth*, by A. Tolver, published in 1752: "All kinds of sweetmeats and sugar contribute very much to the destruction of the teeth, because their gluey juices stick to the teeth; besides, sugars are of an acid, penetrant and corrosive nature. Those who love sugar and use it much, rarely have good teeth."⁹ Numerous other references associating sweet foods with dental caries could be cited but these two will suffice to show that the correlation did not begin in the 20th century.

Because of numerous observations that persons who chewed liberal amounts of sugar cane on plantations did not have rampant decay, the rôle of sweets in tooth decay was seriously questioned by dentists about 1912.¹⁰ The following sentence is quoted from the book by Dr. J. Sim Wallace of England: "An explanation of the fact that the teeth of children who chewed sugar cane were relatively free from caries may be that sugar cane is a highly fibrous foodstuff and detergent in its effects, while the sticky sweets consumed by civilized man are not detergent and therefore induce caries." According to Bogert it takes 3 feet of sugar cane to make one standardized cube of sugar, hence one would have to chew a great deal of cane before very much sugar would be ingested.¹¹ In the light of Dr. Bödecker's studies the vigorous chewing of sugar cane would not only have a cleansing action on the

teeth but also would increase the flow of blood to the dental pulps which in turn would improve the quality of the dental lymph and thus increase the resistance of the tooth to decay.¹² Workers on plantations would also receive vitamin D from sunshine which in turn may be a factor in lessening the caries incidence.

Only when the semi-solid medium was developed so that bacteria could be separated into species was it possible to formulate a working hypothesis as to the etiology of dental caries. In 1890 Dr. W. D. Miller as a result of his work in Dr. Robert Koch's laboratory formulated his now famous theory of tooth decay, as follows: Mouth organisms produce lactic acid in fermenting carbohydrates, and lactic acid decalcifies tooth enamel. Miller also noted that decalcification of enamel occurs at "retention centers," pits and fissures and proximal surfaces.

Dr. F. W. Broderick of England in *The Principles of Dental Medicine*, states "Miller's theory cannot be considered as fully explaining the various circumstances in which we find the presence or absence of caries. Although the theory may be true as far as it goes, and I personally have little doubt of its truth, it cannot be, by any means, the whole truth. It leaves too many questions unanswered, too many undoubted clinical facts unexplained."¹³ This probably expresses the opinion of the leaders in the dental profession today.

There are two schools of thought regarding the bacteriological problems involved in dental caries; one represented by Drs. Bunting and Jay at the University of Michigan, and the other by Drs. Hatton, Fosdick, and Hansen at Northwestern University. Although these investigators differ as to the organisms involved they are in agreement that a diet containing liberal amounts of sweet foods is as a rule more conducive

to tooth decay than a diet low in sweet foods.¹⁴

I shall not undertake a detailed discussion of the dietary studies on prevention of dental caries made on children under 15 years of age by McBeath,¹⁵ by Tisdall and coworkers,¹⁶ or by Mrs. Mellanby,¹⁷ to mention only a few investigators. These workers have in the main stressed the importance of vitamin D in caries prevention. However, the diets which they have fed to children, with the possible exception of those used by Mrs. Mellanby, have been low in sweet foods. It is impossible for me to evaluate her data until more details are given.

Is it not only fair to those investigators who are interested in the bacteriological aspects of the problem to ask the following questions: Is it vitamin D which has arrested caries or have these children been fed diets low in sweet foods which would produce a low count of *L. acidophilus* and/or other organisms concerned with acid production in the mouth and hence the conditions necessary for tooth decay have not been present? Is not Dr. Jay correct when he states . . . "in part, at least the beneficial effects of a satisfactory diet have been due to the automatic lowering of sweet food"¹⁸?

Before commenting further on the studies of McBeath and Zucker I quote some comments on dietary studies in general made by Dr. Mary Moore of Philadelphia:

My own experience makes me question the assumption that little or no caries before 14 years of age assures little or no caries after this age. My report covers 80 cases seen on an average of three or four times a year continuously over a period of 15 years, from the age of 6 to 21. The individuals from whose records I made this report have had not only uniformity of dental diagnosis and treatment but also the benefit of medical care and good food . . . I question the claims that control or prevention of decay can be affected by diet, hygiene, and medical and dental care, unless many years have proven

the validity of such claims. Eight years' observation would have shown, at any time, over 50 per cent of the group free from decay. Yet, observation for 7 years more shows that a belief that decay had been controlled would have been an illusion.¹⁸

Although Dr. Moore reported on only 80 cases, her points are well taken. Most of the caries prevention studies have been made on children under 15 years of age and the periods of observation have been short compared to the length of time she has followed her cases. Investigations have not included children during adolescent years when caries is so often rampant. Hogeboom has discussed the etiology of caries during these teen years from the standpoints of endocrinology and nutrition but has left the question open due to insufficient data.¹⁹

There are two points of view on the rôle played by foods in the dental caries problem:

1. Sweet foods lodge in secluded areas, are acted upon by bacteria which produce acids which attack the enamel.
2. Liberal eating of sweet foods inhibits consumption of other foods which contain dietary essentials such as calcium, phosphorus, fats, proteins and vitamins.

Dr. Applebaum states: "Enamel decalcification is the first essential lesion of dental caries."¹ This supports the first point of view which may be expressed as follows: the flora of the mouth as modified by diet plays a rôle in tooth decay.

So far as I know there are no data extant which directly support the second viewpoint.

Although in the last analysis it is perhaps unfair to stress the importance of any one factor in caries prevention because the body functions as a whole, the paper by McBeath and Zucker, June, 1938, "The Rôle of Vitamin D in the Control of Dental Caries in Children" is of special interest in connection with the second viewpoint expressed above. They make the follow-

ing statements which appear to focus more attention on the importance of vitamin D in caries prevention than any data reported with which I am familiar. They state:

At School A, a new type of experiment was introduced, namely the feeding of the Boyd and Drain diet without the addition of cod liver oil. This resulted in a distinct but moderate reduction of caries incidence which by no means reached the low levels recorded when cod liver oil was included.²⁰

This observation is of tremendous importance from the practical standpoint of controlling caries by diet for the following reason: If the menus served at School A were identical with those served in the other institutions where studies were being conducted and the only variable was that the children at School A were not given the cod liver oil whereas the other children were given it daily, what other explanation is there except that cod liver oil (vitamin D) permits a higher intake of starches and sugars than is possible without it?

No one could say that omitting 3 teaspoonfuls of cod liver oil deprived the children of any known dietary elements except vitamins A and D and small amounts of fat and iodine. The original Boyd and Drain diet contains an abundance of these, hence in the McBeath and Zucker experiment vitamin D is the only factor left to consider. If vitamin D does permit a higher intake of sugar and starches, what is the explanation? Due to the rôle of this factor in calcium and phosphorus metabolism, are the teeth better nourished through the dental lymph when the diet includes a liberal amount of vitamin D? Are they thereby more resistant to the action of acids produced by the flora of the mouth and hence do they show less tooth decay?

These investigators do not comment upon the sunshine which these children

received. If the schools were all in one locality this point is probably of little importance. But in all research where human beings are involved this sunshine variable must be recognized, otherwise confusion may result in interpreting nutrition studies in various parts of the country. The sunshine in Santa Fe, N. M., is unquestionably of greater value than that available to children in a large smoky northern industrial city.

There are two points upon which all investigators would unquestionably agree:

1. A highly satisfactory diet not only for expectant and nursing mothers and young children but for all persons at all ages is a major factor in attaining the goal of preventive dentistry, preventive medicine, and nutrition. Such a diet is of importance not only from the standpoint of general health, but also from the standpoint of making the best teeth possible in the face of personal idiosyncrasies. It is probable that diet plays its greatest rôle in building good teeth during the first 10 years of life. According to Cockayne, hereditary dental defects manifest themselves as other physiological defects do; so an optimum diet is not a panacea for all dental problems.²¹

2. When it is known why certain persons are less susceptible to dental caries than others, and this appears to be the case, science may have a clue to the fundamental principles underlying the cause of this disease.

The question may be asked "Of what value to the practising dentist and to those interested in dentistry from the public health point of view is knowledge of our present understanding of the relation of diet to the flora of the mouth, which in turn apparently means the presence or absence of tooth decay?" It should be mentioned that observations on primitive races and also on numerous persons living under civilized conditions have shown that lack of mouth cleanliness may not and often does not bring about tooth decay when the intake of sweet foods is low. It is the change in the flora due to the intake of sweet foods (starches may also be involved at times) which plays a rôle

in caries incidence according to certain investigators.^{4, 14}

Dr. Bunting says "No tooth was ever made that was strong enough to withstand the forces of caries if they were active in the mouth" and "The hope of controlling dental caries through dietary regulations by building teeth strong enough to withstand caries is wholly unwarranted."²²

Undoubtedly what Dr. Bunting intends to say is that ruling out the small percentage of the population which for no known reason seems to be caries resistant (immune), it is impossible for the majority of persons to build teeth strong enough to permit a high intake of sweet foods. This point would appear to be well taken because no one has reported prevention of dental caries on a highly satisfactory diet which contained a liberal amount of sweet foods.

The data on the relation of nutrition to dental caries may be summarized into the two following practical suggestions:

1. If an individual is susceptible to tooth decay, he should reduce his intake of all sweet foods to a minimum. In this way he will keep the flora of his mouth low in those organisms known to be acid formers. Starches and fats should be his main energy foods.

2. In addition to keeping the intake of sweet foods low, each person should plan his diet so that all factors, including vitamin D, are present in abundance.

The disadvantage of these suggestions is that no one can do these two tasks for us. Each individual must accept the responsibility for taking a highly satisfactory diet and also for lowering his own intake of sweets. Parents must assume the responsibility for children.

Because of this individual responsibility from which at the present time there appears to be no escape, the problem of lowering the incidence of tooth decay is far more difficult to solve than if it were possible to attack it as some other problems in public health are handled, for example, vaccination against smallpox. Whether Dr. P. R.

Howe's Ammoniacal Silver Nitrate Solution as recommended by Dr. J. M. Prime of Omaha will be the method for control of dental caries from the public health standpoint remains to be seen.²³

Long experience in studying dietary problems makes me question whether entire freedom from dental caries, even if this were possible, would be sufficient to induce the average person to refrain entirely from sweet foods. It is perhaps a sounder policy to urge moderation in rather than abstinence from sweets, and admit that some tooth decay will probably result in most instances even though the individual has the best possible personal and professional mouth hygiene care. Optimum nutrition in the light of Dr. Bödecker's work may permit a little more leeway on sweets than a less satisfactory diet.

The cause of dental caries is an exceedingly complex problem but the data extant would appear to force the recognition of the relation of sweet foods to this disease. Again science has apparently offered a theory which seems to explain human experience. The science of nutrition contains numerous comparable examples—the rôle of diet in beriberi, scurvy, pellagra, and xerophthalmia; the rôle of cod liver oil and sunshine in rickets. Continued research on dental caries will unquestionably bring about as satisfactory an understanding of the many factors in this disease as it has in the case of the nutritional deficiency diseases.

REFERENCES

1. Bödecker, C. F. Variations in the Lesions and Activity of Dental Caries. *J. Dent. Research*, 16:51 (Feb.), 1937.
2. Applebaum, E. Tissue Changes in Dental Caries. *J. Am. Dent. A.*, 25:1223 (Aug.), 1938.
3. Boyd, J. D., and Drain, C. L. The Arrest of Dental Caries in Childhood. *J.A.M.A.*, 90:1867 (June 9), 1928.
4. Boyd, J. D., Drain, C. L., and Nelson, M. V. Dietary Control of Dental Caries. *Am. J. Dis. Child.*, 38:721 (Oct.), 1929.
5. Bunting, R. W., and Palmerlee, F. The Rôle of *Bacillus Acidophilus* in Dental Caries. *J. Am. Dent. A.*, 12:381 (Apr.), 1925.
6. Bunting, R. W., and Co-workers. Further Studies on the Relation of *B. Acidophilus* and Dental Caries. *Dental Cosmos*, 70, 1 (Jan.), 1928.

5. Koehne, M., Bunting, R. W., and Hadley, F. P. A Review of Recent Studies on the Cause of Dental Caries. *J. Am. Dietet. A.*, 9:445 (Mar.), 1934.
6. Jay, P. Dental Caries. *J. Calif. State Dental Assoc.*, 13:177 (Sept.-Oct.), 1937.
7. Simmonds, N. Dental Caries (Discussion of Dr. Jay's paper). *J. Calif. State Dent. A.*, 13:217 (Nov.-Dec.), 1937.
8. Pickerill, H. P. *Prevention of Dental Caries and Oral Sepsis*. London, 1912.
9. Weinberger, B. W. *Orthodontics—An Historical Review of Its Origin and Evolution*. St. Louis, 1926.
10. Wallace, J. S. *The Cause and Prevention of Decay in Teeth*. London, 1912.
11. Bogert, L. J. *Nutrition and Physical Fitness*. Philadelphia, 1932.
12. Bödecker, C. F., and Lefkowitz, W. Concerning the "Vitality" of the Calcified Dental Tissues. *J. Dent. Research*, 16:463 (Dec.), 1937; and personal communication.
13. Broderick, F. W. *The Principles of Dental Medicine*. St. Louis, 1936.
14. Hansen, H. L., Fosdick, L. S., and Epple, C. F. The Action of Mouth Organisms on Certain Carbohydrates. *J. Am. Dent. A.*, 24:1611 (Oct.), 1937; *Science News Letter*, 33:132 (Feb. 26), 1938.
15. McBeath, E. C. Experiments on the Dietary Control of Dental Caries in Children. *J. Dent. Research*, 12:723 (Oct.), 1932.
- McBeath, E. C. Vitamin D Studies, 1933-1934. *A.J.P.H.*, 24:1028 (Oct.), 1934.
16. Anderson, P. G., Williams, C. H. M., and coworkers. The Influence of Vitamin D in the Prevention of Dental Caries. *J. Am. Dent. A.*, 21:1349 (Aug.), 1934.
- Tisdall, F. F. Panel Discussion on Dental Caries. *J. Pediat.*, 5:841 (Dec.), 1934.
17. Medical Research Council, *Special Report Series, No. 211*, "The Influence of Diet on Caries in Children's Teeth." Final Report, 1936, London.
18. Moore, M. M. Observation on the Age-Incidence of Dental Caries. *Ann. Dent.*, 3:77, 1936.
19. Hogeboom, F. E. Is Teen-Age Caries an Endocrine Problem? *J. Am. Dent. A.*, 24:422 (Mar.), 1937.
20. McBeath, E. C., and Zucker, T. F. The Role of Vitamin D in the Control of Dental Caries in Children. *J. Nutrition*, 15:547 (June 10), 1938.
21. Cockayne, E. A. *Inherited Abnormalities of the Skin and Its Appendages*. London, 1933.
22. Bunting, R. W. The Prevention of Dental Caries. *J. Michigan State Dent. Soc.*, Mar., 1937.
23. Prime, J. M. Controlling Dental Caries. *J. Am. Dent. A.*, 24, 1950 (Dec.), 1937.

Development of Industrial Hygiene in the United States*

J. J. BLOOMFIELD, F.A.P.H.A.

Sanitary Engineer, U. S. Public Health Service, Washington, D. C.

STUDENTS of industrial hygiene have known for some time that the health of the worker may be influenced not only by the working environment, but by factors associated with conditions outside the factory. However, it is only within the past year or two that we are beginning to realize that industrial health forms an integral part of the health of the community, and that our approach to industrial hygiene should be from the public health viewpoint. In view of the tremendous interest in industrial hygiene and the attendant rapid growth in industrial hygiene activities which has been taking place in this country during the past three years, it is most fitting and timely that we take inventory of the entire industrial health problem, its development, progress and future.

THE INDUSTRIAL HYGIENE PROBLEM

To assist us in determining the needs and the type of action to be taken in this field of public health, it is essential to consider first some aspects of the magnitude of the problem.

If we look upon industrial hygiene as adult public health, it is obvious that we are concerned with a large percentage of our population since, accord-

ing to the last federal census, there were approximately 49 million gainfully employed persons. In the past, industrial hygienists have concentrated their efforts on the so-called *industrial population*—that group of workers engaged in the manufacturing, mechanical, and mining industries. Although it is probably true that the bulk of the occupational diseases occur in these industries, nevertheless, the 10 million workers in agriculture, the 4 million persons employed in transportation and communication, and the large number of workers in domestic and personal services, all have health problems deserving of attention.

While insufficient data have thus far prevented our recognition of the health problems in non-industrial pursuits, we have ample evidence to indicate that there exists a greater mortality rate in the industrial population than in the whole group of gainfully employed persons. Excess mortality is especially notable among unskilled workers, among whom the death rate from all causes in certain states was found to be 100 per cent in excess of the death rate among agricultural workers.

Studies of illness in industry made by the U. S. Public Health Service also show high rates of illness among workers. For example, the incidence of degenerative conditions and such diseases as occupational tuberculosis, and

* Chairman's Address presented before the Industrial Hygiene Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

pneumonia was found in the industrial population to be higher than average. There is evidence to justify the opinion of authorities in the field of tuberculosis that deaths from this disease can be reduced 50 per cent by health supervision of workers in occupations predisposing to the disease, by detection of minimal cases, and by provision of adequate medical and institutional care in the early stages of the disease. A large amount of information testifies that a majority of cases are discovered too late for effective treatment. Again, it is also known that pneumonia mortality and disability are excessive among workers exposed to extremes in temperature, inclement weather, toxic gases, and dusts. Health supervision of the worker and his environment has been found effective in reducing illness and death due to this cause.

Workers employed in large establishments are provided health services to some extent. However, the provision of health services is made somewhat more difficult because of the fact that a large number of our workers are employed in small establishments. Recent studies¹ have indicated that as a general rule the smaller the plant the more costly is such a service to both the employer and the employee. In a study recently published by the American College of Surgeons on 299 companies employing 1,237,755 workers, it was found that establishments having 1,000 or more employees showed a per capita cost for medical and compensation purposes of \$8.42 as compared with a cost of \$13.52 for the plants having less than 500 workers. The significance of this finding becomes more obvious when it is realized that approximately 62 per cent of the workers in manufacturing establishments in this country are employed in plants having less than 500 workers. However, the obstacles associated with the development of a complete health service for employees

in these small plants may be overcome. But to do so will require increased activity and the coöperation of all agencies interested in health conservation. Public health workers can play an important rôle in correlating the activities of these agencies.

In considering the improvement of the health of our workers, we find that we are confronted with several problems. First, because the relationship between cause and effect is more evident, the disability and lost time due to occupational accidents is still very important. In spite of the fact that great strides have been made during the past 20 years in the prevention of accidents, this form of injury still constitutes an important problem. According to the last preliminary report of the National Safety Council, there were 19,000 occupational deaths in 1937.² Studies also indicate that we have not approached minimum rates since the records for accidents in certain steel companies with best practices show a far lower rate than for the industry as a whole.³ Second, it is well known that certain occupations are associated with poisoning, disease and high mortality. In the third place, many of our workers in early adult and late life are found to lack the physical capacity and mental stamina to undertake certain types of work. And lastly, we have come to realize that we have far too much absence from work due to sickness or fatigue, or other incapacitation due to a complex set of factors, some of which are no doubt controllable.

While accidents, occupational diseases, and high occupational death rates appear to be impressive, there is no doubt that the least dramatic side is probably by far the most important—namely, the lost time and incapacity due to illness. It is this last condition that is so widely prevalent as to be almost universal in all localities, at all ages, in all occupations. A vast amount

of wasted energy and life due chiefly to preventable illnesses, some of which may be contributed by the working environment, presents a problem in need of our serious attention.

Although we have made significant progress in the control of certain preventable diseases, as is evidenced by the declining trend of our death rate in the last 40 years, it is a fact that this saving of life has taken place chiefly in childhood and in early adult life. No significant increase appeared to occur during this period in the average years of life remaining to persons of middle and advanced age. The death rates from some important diseases of adult life have been increasing, a phenomenon understandable in the light of the fact that the principal causes of death operating in the advanced years are primarily chronic. Preliminary data from the National Health Survey,⁴ based on surveyed persons of all ages, show that chronic diseases, including permanent impairments, alone account for 6 of the 10 days of incapacity due to illness and accidents experienced by the average person per year; and with respect to sickness and accidents, data recently published by the U. S. Public Health Service show in the instance of a public utility that on the average 7.5 days were lost annually by males and 10.9 by females.⁵

These studies further show that approximately half of the deaths from chronic diseases occur in the working ages (15-64), and that about 87 per cent of the persons in this age group are reported to have such ailments. Furthermore, about 50 per cent of those reported with chronic disease fall into the groups under 45 years of age. All of these facts should focus our attention on the problem of chronic disease among younger workers, and it would seem that if an attempt were made to discover these diseases in their earlier

stages, a great saving in life and health would be accomplished. In other words, the greatest opportunity today for a substantial saving of life appears to be in the field of chronic diseases and the class offering this opportunity is the industrial population.

DEVELOPMENTS IN INDUSTRIAL HYGIENE

If we examine the early history of industrial medicine, we will find that the chief function of industrial medical departments was the treatment of traumatic injuries. Gradually, the work of the medical department began to extend beyond surgical treatment to the medical phases of the problem. Such functions as preemployment and periodic physical examinations, job placement, and, more recently, medical and engineering control of occupational diseases, began to take their rightful place in industry. Where in the past attention was given mainly to the improvement of machinery, recent activities have been directed to the economic waste resulting from failure to provide protection against controllable health hazards. One of the primary stimuli to the introduction of more adequate medical services in industry has been the passage of workmen's compensation laws for accidents and occupational diseases. Today, 46 states have laws providing benefits in the event of accidental injury, and 21 of these states have enacted legislation compensating workers for one or more occupational diseases.

With reference to activities outside of industry itself, we find that these were limited chiefly to research on the part of federal agencies and one or two universities. Although the research work conducted by such agencies as the U. S. Public Health Service, the U. S. Bureau of Mines, and one or two universities was productive of considerable knowledge concerning industrial health.

TABLE I

*Summary of Industrial Hygiene Activities in the United States**

State	Number of Gainful Workers	Number of Workers in Manufacturing, Mechanical and Mineral Industries	Number and Kind of Personnel				Annual Budget
			Medical	Engineering	Other Technical	Clerical	
Alabama	1,026,320	220,378	1	0	0	0	5,600
Arizona	165,304	45,811					
Arkansas	667,870	83,560	0	1	0	1	4,200 †
California	2,500,969	673,646	1	1	1	1	22,020
Colorado	402,894	88,830	0	0	0	0	4,200 †
Connecticut	677,292	337,445	1	1	3	2	25,557
Delaware	98,104	35,348					
Florida	599,010	131,480					
Georgia	1,162,174	240,989					
Idaho	162,223	27,934	0	0	0	0	5,000 †
Illinois	3,184,875	1,164,979	2	2	3	2	35,400
Indiana	1,251,177	464,549	1	1	0	1	11,500
Iowa	912,832	167,147	0	2	0	1	8,350
Kansas	694,276	132,662	0	1	1	1	10,820
Kentucky	907,166	220,233					
Louisiana	815,725	156,030					
Maine	308,617	104,201	0	0	0	0	†
Maryland	672,906	228,599	1	2	3	2	12,900
Massachusetts	1,814,422	840,300	0	1	2	2	19,200
Michigan	1,927,498	860,164	1	6	5	4	45,500
Minnesota	992,847	210,299	0	0	0	0	1,335 †
Mississippi	844,887	79,318	1	0	1	1	9,100
Missouri	1,458,054	390,399	0	3	0	1	13,005
Montana	216,471	44,637					
Nebraska	507,022	71,517					
Nevada	42,885	11,776					
New Hampshire	192,671	89,461	0	1	0	1	8,380
New Jersey	1,712,125	741,299					
New Mexico	142,866	23,931					
New York	5,523,085	1,995,924	7	7	12	7	118,614
North Carolina	1,141,129	289,917	2	2	1	1	27,500
North Dakota	240,317	18,095					
Ohio	2,615,938	1,094,650	3	1	2	2	25,300
Oklahoma	828,029	172,163					
Oregon	409,680	102,125					
Pennsylvania	3,722,428	1,796,944	2	9	0	1	56,490
Rhode Island	297,168	164,304	2	3	1	1	23,000
South Carolina	687,721	146,344	1	1	0	1	10,300
South Dakota	247,678	24,207					
Tennessee	958,209	213,077	1	1	0	0	11,000
Texas	2,237,118	395,802	1	3	1	1	24,290
Utah	170,013	44,977					†
Vermont	141,190	42,851	1	1	0	1	11,500
Virginia	880,276	221,539	1	1	1	1	19,000
Washington	664,813	181,765	0	1	0	1	6,200
West Virginia	570,459	242,115	1	1	0	1	17,500
Wisconsin	1,129,546	380,229	1	2	0	1	11,000
Wyoming	92,451	19,046					
Totals	48,588,730	15,432,996	32	55	37	39	612,276

* All units in Health Departments except New York and Massachusetts; these two are in Labor Departments.

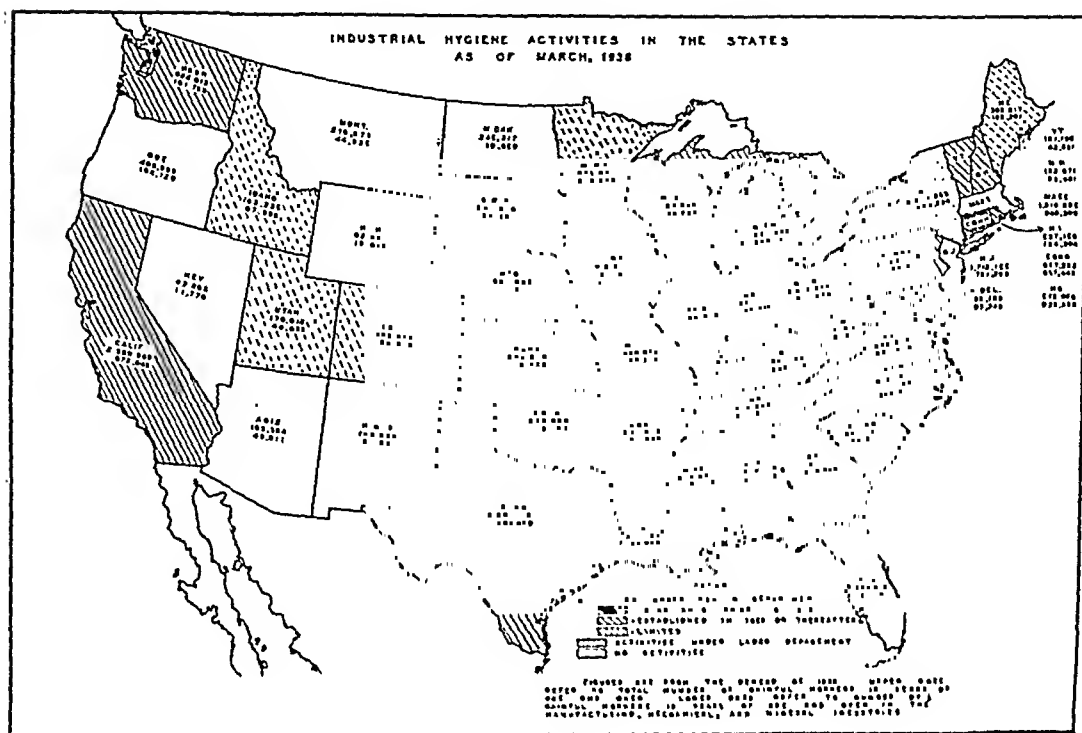
† Survey being conducted to determine state's needs in industrial hygiene.

hazards, very little application of these findings was in practice in the states. As a matter of fact, prior to 1936, industrial hygiene administration in state and local government was confined to three or four health departments, and one or two state departments of labor. In all probability, this limited work in

industrial hygiene also accounted for the few schools giving instruction in this field of public health.

Responsibility for safeguarding the health of our workers rests chiefly with state and local government. This fact is an outgrowth of our political system which gives much autonomy to

FIGURE I



the individual states. The agencies of the federal government concerned with industrial hygiene are engaged primarily in the collection and dissemination of information, conducting field studies, laboratory research, and protection of the health of federal employees. Prior to 1936 most states dealt chiefly with matters of safety, sanitation, employment of women and children, and compensation of employees following accidents.

When funds were made available by the Social Security Act for the development and extension of all branches of public health work, the U. S. Public Health Service, in cooperation with the Conference of State and Provincial Health Authorities of North America, inaugurated a program designed for the purpose of establishing active industrial hygiene work in state and local health departments. Table I presents a summary of industrial hygiene activities in the various states, while Figure I depicts graphically the progress of these

activities in the United States. It is evident that in the short period elapsing since the passage of the Social Security Act, the development of industrial hygiene has been rapid; and if our progress continues at the same pace, it may in time attain a level commensurate with its value to the national economy. It may be seen from Table I that there are now 26 industrial hygiene units actively engaged in this work, while 6 other states are conducting surveys for the purpose of determining their needs with reference to such a program. Where less than three years ago the small sum of approximately \$100,000 was being budgeted for this activity, today nearly three-quarters of a million dollars are being expended in this work. Where three years ago only 12 million gainfully employed persons were receiving a limited degree of industrial hygiene service, today approximately 40 million workers are given some consideration with reference to industrial health hazards.

The progress indicated appears phenomenal. But if we compare the 15 mills per worker being expended on industrial hygiene activities to the amount of money per capita spent for other public health work, and bear in mind the large working population in this country, the numerous problems still unsolved, the fact that we are spending billions of dollars annually in compensation and other costs for injuries and illnesses, it is apparent that we are still only at the beginning.

In inaugurating industrial hygiene programs the various states have been confining their efforts chiefly to the evaluation and control of occupational diseases in industry. This method of approach to the industrial health problem is logical for several reasons. First, the relationship between specific occupational diseases and environment is often evident, and tangible benefits of control practice are readily demonstrable. Second, the manner in which some occupational diseases have developed in certain industries has been of such a dramatic nature that the public has become more conscious of the importance of such diseases and the need for providing measures for their control. And finally, we must not lose sight of the fact that even today many public health workers view industrial hygiene as merely accident and occupational disease control. As already stated, however, industrial hygiene is essentially adult health promotion among the gainfully employed, and necessarily runs the entire gamut of public health for these individuals.

Nation-wide data to support this view are being collected and analyzed. It is hoped to have some basic statistics on the subject of illness and death by occupation in this country as soon as the U. S. Public Health Service has had an opportunity to analyze the results of its recent inquiry on more than a half-million workers. Limited statistics for

the prevalence of occupational diseases are available for only a few states, since the principle of compensating for an occupational disease is of recent origin in this country, and the general reporting of occupational diseases continues to be in a chaotic state. In Wisconsin a workmen's compensation law has been in operation longer than in any other state. Some unpublished analyses of recent data from this state have been furnished by Dr. W. M. Gafafer of the U. S. Public Health Service and bear examination. For the 16 year period from 1920 to 1935, occupational diseases accounted for 2 per cent of the total compensated cases. During 1935 this percentage increased to 2.8. During the same 16 year period, 2.8 per cent of the total costs for all injuries was due to occupational diseases, but during 1935 the corresponding percentage increased to 7.1. The compensation cases settled in 1935 represented a loss of over 2 million working days, and of these days lost, 8 per cent were accounted for by occupational diseases.

It is realized, of course, that some occupational diseases are not reportable, and a certain number of such diseases receive no compensation. Still, there is sufficient evidence to indicate that although the incidence of occupational diseases and costs are rising, they still constitute but a small percentage of total compensated cases and costs. Reports from other states, such as New York, New Jersey and Ohio, show a similar trend. According to the United States Department of Labor, the total direct and indirect costs of industrial injuries in this country are approximately 5 billion dollars annually, and of this amount, occupational diseases account for but a small percentage.

A valuable criterion in the study of disease is the amount of time lost from work. This test not only measures disability, but also reveals the social and economic significance of the problem.

Recent studies of absenteeism from illness and injury indicate that illness causes far more absenteeism than do industrial injuries. In a limited study made by the American College of Surgeons,¹ 116 companies in various parts of the United States, employing 352,591 workers, reported a loss of 208,648 days in 1936 on account of industrial injuries, or a loss of 0.6 day per person. Of this total amount of absenteeism for industrial injuries, occupational diseases accounted for only 0.01 day per person per year. Some of these reports to the American College of Surgeons contained accurate data on absenteeism, which showed that the average worker loses nearly 9 days per year from non-industrial injury and illness, or approximately 15 times as much time as he does from industrial injuries. Additional evidence on this subject has been reported recently in Great Britain,⁶ where among 5,197,643 persons employed in factories in 1935, there were only 428 cases of occupational disease, 163 of these being lead poisoning and 142 epitheliomatous ulcerations. Thus, the British experience with reference to occupational diseases appears to be similar to our own.

All of these facts indicate that the economic losses from absenteeism due to illness among industrial workers must be enormous. When we take into account the wide difference between the few millions of dollars spent on industrial hygiene by industry and government, and the billions lost due to accidents, occupational diseases and sickness in industry, we are forcefully brought face to face with the meager efforts of our present attempts in the direction of the protection and improvement of the health of our workers.

It would seem, therefore, that if we are to improve the general health status of the most important and numerous group in our population, it will be necessary to control not only unhealthful con-

ditions in the working environment, but also to give consideration to such factors as proper living conditions, nutrition, elimination of strain and hurry, communicable diseases—in fact, a general adult health program for our workers. In order to promote a broad and effective industrial health program of this type, it will be necessary to integrate it closely with existing public health activities.

AN INDUSTRIAL HYGIENE PROGRAM

Experience has shown that in the practice of industrial hygiene the essential features of a program should include fundamental research, application of research and educational activities designed to acquaint the public with the importance and needs of industrial health. State and local health departments are by the very nature of their organization and their responsibility most fitted to carry out the application and education phases of the program, leaving the investigative phases to federal, university, and other research agencies. In view of the experience of the U. S. Public Health Service in this field, it has been possible to recommend a program which could be undertaken by the various units.⁷

The determination of the scope and nature of the industrial hygiene problem should be the first consideration, and this will indicate the kind, magnitude, and direction of the work to be undertaken. It would be possible to make this determination in any state, were reliable statistics available on industrial morbidity and mortality, and accurate information on occupational diseases and accidents. At present such data are lacking in nearly all of the States; in some instances information on accidents exists, and less frequently, on occupational diseases. A preliminary survey of all work places, such as is now in progress in many of our states, will yield information on the potential occu-

pational disease hazards and on the extent of health services. However, the information obtained by such surveys is very limited, and steps should be taken to secure reliable data on lost time due to occupational diseases and other illnesses.

However, the preliminary surveys now in progress indicate that already sickness records are kept on nearly half of our working population. It is felt that by an intensive educational campaign among industrial officials and local physicians, arrangements can be effected for securing reports of absenteeism due to occupational diseases and other illnesses. These reports should be uniform and should be transmitted to the state department of health. Duplicate copies of selected data could also be furnished to the U. S. Public Health Service for study. The Service has been receiving such data for many years from a group of 30 industrial sick benefit organizations providing sickness benefits for approximately 170,000 industrial workers, so that the machinery for expanding this plan on a nation-wide basis has already been tried and found satisfactory. Such fundamental information will form the basis of constructive programs within the states, since it will then be possible to evaluate those conditions causing excessive absence due to illness and to take the necessary steps for their control. In so far as the federal government is concerned, data of this nature should serve as a guide in any future research in this field.

When the various health hazards in industry have been established, the industrial hygiene unit is in a position to evaluate each one and to determine the means necessary for its control.

It is evident from a study of the program recommended herein that the object has not been to carry on work which has already been done or which is being accomplished by other agencies,

but to supplement these activities with work which is necessary in order that public health may be brought to our industrial workers. For this reason, the Public Health Service has recommended that the industrial hygiene program be accomplished coöperatively and the local industrial hygiene units, in addition to furnishing services to physicians, industry, and labor, should serve also as a source of information for other state agencies. Perhaps one of the difficult problems which each unit has had to solve is that of coördinating its work with existing agencies, such as departments of labor, industrial commissions, and others.

The above program is a summary of the activities being attempted by the various industrial hygiene units in this country. As may be seen from an examination of Table I, most of these units employ a very small personnel—usually a physician, an engineer, a chemist and a secretary—and, in addition, are endeavoring to carry on this program with very limited funds.

It should be evident that if all the factors influencing the health of our workers are to be considered, then it will be necessary to draft all of the resources at the disposal of a department of health. This is a perfectly legitimate view of the problem if we pause to consider the method of approach which may be employed. For example, it is conceded that many of the diseases of childhood are not directly associated with the school environment; yet this fact has not deterred our health departments and practising physicians from doing their most effective work in the prevention of childhood diseases through the medium of the school. It is our feeling that the protection of the health of the industrial worker requires the same type of organized effort that has proved satisfactory for the protection of the health of the general public. Hence, it is logical to attempt to com-

bat our adult diseases by approaching the problem through the medium of the factory. For example, some public health administrators may feel that with the limited number of so-called industrial workers in their states, industrial hygiene activities may not be justified. Yet, there is no reason why these same health departments cannot carry on a program of nutrition, venereal disease, tuberculosis, or malaria control through the industrial groups in coöperation with the industrial hygiene unit. By so doing they will be practicing effectively public health among a vast number of people. At present such programs employ the home as a means of contact. It would seem that this approach of bringing public health to the factory should commend itself from the viewpoint of efficiency alone. The fact that many illnesses among our gainfully employed may not be directly caused by the working environment should not deter physicians and public health workers from attempting to eliminate the causes of these diseases through the working environment.

It is desired to stress the fact that in order to carry on any kind of public health work in the factory, it is still necessary that the personnel know industry and industrial processes, and for this reason the only persons logically to guide the work should be those particularly trained in the field of industrial hygiene. However, there is no reason why there should not be a closer coöperation between the industrial hygiene personnel in a state health department, the various local public health units, and the medical practitioner, in an attempt to bring public health to our gainfully employed and indirectly to their families.

In other words, the industrial hygiene unit in the state department of health will determine the nature and extent of the health problems in industry, will attempt to study and control those spe-

cific environmental health hazards which require highly specialized personnel, and will also integrate, as far as is practicable, with local health units, those public health functions which are for the common benefit of the industrial and general populations of the state.

I have attempted to picture the problem of industrial hygiene in this country, indicating its magnitude, its development, and have suggested a course for the future. Rather than essay to summarize my remarks, I should like to emphasize two points in my discussion which I consider of significance. First, we must supplement our present information on occupational diseases and accidents with a knowledge of absenteeism with respect to frequency, duration, and cause in each numerically important occupational group in a working establishment. Such data will serve to reveal to the management and to the public health worker the type of action which should be taken to obtain the maximum reduction in the amount of time lost from work on account of disability. We cannot brush aside the fact that it is this lost time which is so important both from a humanitarian and economic viewpoint. Second, we must consider the industrial hygiene problem as one of adult health. It seems to me that only by approaching the subject of industrial hygiene from the standpoint of adult hygiene will we be able to make the necessary progress in this important field of public health.

To accomplish this effectively, it will be necessary first to develop a strong industrial hygiene unit in the state health department, consisting of various specialists in the field of occupational diseases and other causes of disability. With such a unit to guide the work, it should be possible to integrate existing public health activities with the program of industrial hygiene. Only by such coordinated effort can we hope to improve the health of our industrial workers.

REFERENCES

1. Newquist, M. N. *Medical Service in Industry and Workmen's Compensation Laws*. American College of Surgeons, 1938.
2. *Accident Facts*. Preliminary 1938 Edition. National Safety Council, Chicago, 1938.
3. Accident Experience in the Iron and Steel Industry to the End of 1932. *Month. Labor Rev.* Bureau of Labor Statistics, U. S. Department of Labor. Vol. 37, No. 3 (Sept.), 1933.
4. Preliminary Reports. The National Health Survey: 1935-36. The Magnitude of the Chronic

Disease Problem in the United States. *Bull. No. 6.* Sickness and Medical Care Series, Natl. Institute of Health, Washington, D. C., 1938.

5. Gafner, W. McK. Frequency and Duration of Disabilities Causing Absence from Work Among the Employees of a Public Utility, 1933-1937. *Pub. Health Rep.*, 53, 30 (July 29), 1938.

6. Buchan, J. J., and Stewart, Donald. Public Health Services and Industrial Hygiene. *Pub. Health*, London, LI, 6 (Mar.), 1938.

7. Bloomfield, J. J., and Peyton, Mary F. The Evaluation of the Industrial Hygiene Problems of a State. *Pub. Health Bull. No. 236* (June), 1937.

Value of the Vital Statistics Data on Birth and Death Certificates in County Health Work*

EARLE G. BROWN, M.D., F.A.P.H.A.

Commissioner, Nassau County Department of Health, Mineola, N. Y.

VITAL statistics are of tremendous value to every health department—local, state, or national. From these data it is possible to learn the number of individuals born each year, the number of deaths and from what causes, as well as particulars by color, sex, and age, and other vital facts. Vital statistics record the progress which is made in public health. We propose to present for discussion, certain facts relating to births and deaths from the standpoint of a county health department.

Among the American Colonies, Massachusetts was the pioneer in the inauguration of a system of vital book-keeping. A law was passed in 1692 which required the town clerk to register marriages, births, and deaths. This state, in 1842, enacted a registration law which was amended in 1844. The Secretary of the Commonwealth was made the custodian of these records.¹

Records of the early meetings of the American Public Health Association show that vital statistics was one of the subjects which received the serious consideration of the members. Through

activities of the American Public Health Association, The American Medical Association, and other interested organizations, the "Model Law" for vital statistics was developed in 1907. The "Model Law" designates the state as the primary registration unit. With certain exceptions, this work is a function of the state health department. Either the state health officer or some member of his staff is the state registrar of vital statistics.

States are divided into registration districts with cities, towns, townships, villages, or other units comprising a primary registration district. The local registrar may hold his office by reason of his appointment or election as a town, village, or city clerk, or may be appointed for a definite term by the state health officer or state registrar. For efficient service, the latter method is to be preferred.

Transportation was a serious problem when the Model Law was developed. Large numbers of registration districts were organized which would not be required under present conditions. As new communities developed into cities and villages and were incorporated, additional districts resulted. Consequently, there has been a gradual increase in the number of registration districts. In some counties there may

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-Seventh Annual Meeting, Kansas City, Mo., October 25, 1938.

be less than 10 districts, while in others the number may reach 50 or 60, or more. The additional registration districts have materially increased the work of state divisions of vital statistics.

In order to simplify registration, one individual may serve as the registrar for several districts. The following will illustrate this suggestion. One New York State town has an area of 129.5 square miles. In this town are 15 incorporated villages and one city. The town clerk is the registrar for the rural area as well as for 13 of the incorporated villages. We have been informed this arrangement is agreeable to all persons concerned, although the office is not centrally located. If local registrars do not forward their reports promptly, the work of the state registrar in checking and tabulating the returns is delayed. A further delay may be experienced in the classification of certificates, due to the omission of necessary data. This is especially true as relates to the medical and statistical particulars of death. Due to the volume of work done by a division of vital statistics and the delays experienced in securing complete reports, it is not unusual for a period of weeks or months to elapse before detailed summaries are available. This is not a criticism of any division of vital statistics, but a statement of fact. It is not generally realized that there is a considerable interval between a rural death from some preventable cause and its tabulation by the state health department. Numerous miles and many months may intervene.

In recent years local full-time health services have assumed a new importance in the nation's health program. In these health departments are qualified and trained experts, not only in communicable disease control, sanitation, child and maternal health, but in other specialties, including vital sta-

tistics. The full-time health department provides a definite integrating agency between the event of a birth or a death and its tabulation, which has not previously been available to the statisticians. It is logical, therefore, that the county health department, operating on a full-time basis and with qualified personnel, should be recognized and have a significant part in the vital statistics program.

The county health department may serve as the collecting agency in two ways: First, if the county is small in area, it may be designated as a registration district with the health officer as the registrar. He is then responsible for the collection of birth and death certificates, their local registration and prompt transmission to the state registrar at the close of the month. However, the county with so limited an area as to have but one registration district will be the exception. A second method will apply to counties having more than one registration district. Arrangements may be made for birth and death certificates to be transmitted to the state health department through the county health department. This may be accomplished by an informal agreement or by an administrative order issued by the state health officer under which local registrars would forward certificates to the county health department without delay after the data have been copied in the register. The county health department would thereupon make copies for file and transmit the original certificates to the state registrar at the close of the month.

The latter method will be placed in operation in Nassau County, N. Y., in the near future. The state registrar of vital statistics will notify the local registrars of the State Health Commissioner's administrative order effecting the change. A representative of the State Health Department will call on each of the local registrars to discuss

the new arrangement and to answer any questions. In all other respects, the system of registration will remain unchanged. Local registrars will forward to the State Health Department the usual report card showing the number of certificates received during the month, or if no certificates were received, a card containing a statement to that effect.

Since the area of a county is small in comparison with that of a state, the health officer may easily communicate with local registrars by personal call or telephone. On the other hand, registrars will find it possible to utilize the services of the health officer or his staff when confronted with technical questions on registration.

As certificates are received in the office, file or index cards are prepared for each birth and death. Certificates are checked for completeness of information. With the approval of the state registrar, the health officer may query statistical and medical particulars, or other data which have been omitted.

The file card for a birth should be of sufficient size that additional particulars may be entered, such as a record of immunization or vaccination reported by the attending physician or from clinics; the occurrence of communicable diseases, as well as other information relating to the health of the child. This card, in reality, may be a life history of the child as long as he lives in the county.

Each nurse is furnished a record of the births reported in the district to which she is assigned. She will arrange a regular schedule of visits to these homes and will supplement the advice of the attending physician by actual demonstrations in the care of the baby. The nurse, as soon as the baby has reached the age for the application of certain preventive procedures, will stress the importance of those measures,

and the information will be entered on the record card as soon as the child has been immunized or vaccinated. It is anticipated that the nurse eventually will have knowledge of the personal health of not only the babies in her district, but also of the preschool and school group. A record will be available of all visits made by the nurse, and if any unusual condition should occur, this record will show whether or not she has made her calls at the homes involved.

Statisticians will agree that the use of a prophylactic for ophthalmia neonatorum is of great importance to the local health department. Each birth certificate may be reviewed to learn if the preventive was used. If any physician or midwife is not using it routinely, the local health department will be in a position to demand compliance with the law.

Health officers should have immediate and accurate knowledge of all deaths. Daily receipt of these certificates provides this information and allows an investigation of such fatalities, if such is necessary. Communicable disease deaths are checked against case reports. If the case is not of record, it will be possible for the health officer to confer with the physician, secure the report and also learn why compliance was not had with the communicable disease regulations.

It is to be presumed spot maps of the major infectious diseases such as diphtheria, typhoid fever, scarlet fever, measles, whooping cough, pneumonia, and tuberculosis are kept in every health department office. If so the record of deaths may be shown by substituting a different colored tack to that used to show the case. Of equal importance is a spot map for infant deaths. By use of this method, it will be possible to visualize their distribution.

The circumstances of maternal and

infant deaths should be as thoroughly investigated as those due to communicable diseases. Prompt receipt of these certificates will permit such investigations, whereas, if they are forwarded direct to the state health department several weeks may elapse and necessary supplemental information may be forgotten.

All deaths from causes other than communicable diseases should be routinely checked against the syphilis and tuberculosis register. It will not be unusual to find an occasional report of a death from causes other than the two diseases and the case report may be removed from the register.

In the local health department it will be possible to review death certificates of individual physicians if occasion demands. Such certificates may be studied over a stated period and if there are repeated inaccuracies, a personal call to the physician's office may adjust these particulars. The same procedure will apply to causes of death, if vague and indefinite terms are used. We believe this will stimulate physicians to include greater detail of the causes of death on the certificates which they sign. The full-time health department should thus increase the accuracy of the original records on which statistics depend. Even though the tabulation may be accurate as to the certificate received, primary accuracy is essential. There is no more efficient method of improving the accuracy of certificates than by utilizing the services of the county health department.

The performance of autopsies may be stimulated by the health officer who is interested in obscure causes of death. Personal contact to establish this procedure is not possible from the state health department.

It has been said: "There are potential accident hazards in every field of human activity and in every individual act. Disorder in the home, improper

driving, the careless hunter, the unguarded machine—are but a few of the all-pervading causes of the accidents which each year kill 75 to 85 of every 100,000 people and injure 100 times as many. No occupation, no recreation, no avocation is secure from the oftentimes disastrous consequences of unsafe practices.²

Accident prevention has been recognized for years as essential to good operation. As a result, industry has achieved remarkable results in the reduction of accidents among its employees. While these accidents have declined, those due to motor vehicles, to home causes, or in public places have increased. It is only within recent years that there has been a real interest in the prevention of accidents other than those which are incident to industry.

Accidents may be prevented. To develop an intelligent preventive program, information must be available as to where and under what circumstances these mishaps occur. Within the past few years a number of state health departments have inaugurated special studies of fatal accidents which were made possible only through access to death certificates. Primarily, the state must take the initiative and supervise such studies, but of necessity must secure assistance from the communities where the fatalities occur. No other unit of the county government is as well equipped to secure this information as the health department. The work requires the active interest of the health officer and his staff. Of especial value in securing this information and also in advancing the cause of safety is the public health nurse. Field nurses, or other field personnel will secure greater details of the accident than would be contained in the report of the medical examiner, or than could be secured by correspondence.

Valuable use will be made by the

county health department of the vital statistics data on birth and death certificates. There is an advantage in having these data centralized, in order that such information as may be requested will be supplied without delay. The reading public is interested in health conditions, and especially in those factors which relate to mortality. Frequent and complete details on both births and deaths may be prepared and released to the public press.

The health officer will find it possible with such data to evaluate more properly the progress in public health work in his county. Consequently, in participating in vital statistics registration the county health department increases the efficiency not only of its own program, but also its services to the public.

REFERENCES

1. Whipple, George Chandler. *Vital Statistics*.
2. *Accident Facts*, 1937 edition.

Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis*

ROY F. FEEMSTER, M.D., DR.P.H., F.A.P.H.A.

Director of the Division of Communicable Diseases of the Massachusetts Department of Public Health, Boston, Mass.

ABOUT the middle of August, 1938, cases of encephalomyelitis in horses were recognized in Massachusetts and it was soon ascertained that an epidemic of considerable proportions existed. On August 12 a child from Brockton died of encephalitis, and when a second child from the same city died on August 30 a rumor spread that the two had been victims of the disease prevalent among horses.

On September 1 the Massachusetts Department of Public Health began to be bombarded with questions as to the truth of the rumor. The answer given was that there had never been an authenticated case of human disease due to the equine virus. On September 2 a death from encephalitis was reported in a child from Marshfield, not far from Brockton. On the same day it was learned that a child, reported on August 31 from Abington as poliomyelitis, had been sent to the Haynes Memorial Hospital where a diagnosis of encephalitis was made. Likewise, on the same day a telephone request was received for aid in making a diagnosis of an illness in a child from Rockland. A consultant of the department, sent to see the case, found that the symptoms were those of encephalitis.

All five of these cases occurred within 15 miles of each other, the nearest being 20 miles southeast of Boston. An interesting coincidence was that they had occurred in essentially the same area as the equine disease. Because of this fact and also on the chance that this was just the beginning of an outbreak similar to the one at St. Louis, the department arranged for virus studies on any fatal cases that might occur. Over the Labor Day week-end the child, seen by the department consultant and transferred to the children's Hospital, died. Two other cases admitted to the Haynes Memorial Hospital on September 1 and 3 also proved fatal. Brain tissue from the first case was put into experimental animals in the Department of Bacteriology of Harvard Medical School, and brain tissue in glycerine from all three was sent to the Rockefeller Institute at New York.

NOTE: The author is merely acting as spokesman for the Department, most of the members of the Division having taken part in the investigation. The Department wishes to acknowledge its indebtedness to Dr. J. E. Gordon, Dr. C. F. McKhann, and Dr. S. Farber of Harvard Medical School and the Children's Hospital for assistance in guiding the investigation and evaluating the epidemiological, clinical, and pathological findings; to Dr. L. D. Fothergill and his associates of Harvard Medical School and Dr. L. T. Webster of Rockefeller Institute for making virus studies; to Dr. C. Wesselhoeft and Dr. E. C. Smith of the Massachusetts Memorial Hospitals for information in regard to their cases; and to Dr. James P. Leake of the U. S. Public Health Service, and Lt. Col. J. S. Simmons and Lt. Col. Raymond Randall of the Office of the Corps Area Surgeon, First Corps Area, Boston, for valuable suggestions and information.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 26, 1938.

During the next few days a number of additional cases of encephalitis were discovered in the same area, and brain tissue from other fatal cases was obtained for virus study.

Information was received by the Massachusetts Department of Public Health simultaneously from Fothergill, Dingle, Farber, and Connerley¹ of Harvard Medical School and the Children's Hospital, and Webster and Wright² of the Rockefeller Institute that the eastern strain of the equine encephalomyelitis virus had been isolated from the brain tissue. The investigation immediately assumed a new importance. The existence of a new human disease had been established. The virus is known to be widespread in horses along the Atlantic coast. If the western strain can also cause human infections, a public health problem of some magnitude may confront us.

The U. S. Public Health Service had been informed of the increased prevalence of encephalitis, and when cases were definitely proved to be due to the equine virus Dr. James P. Leake and an entomologist were sent to Boston to aid in the investigation. Because Kelser³ and others had demonstrated that mosquitoes can transmit the disease in laboratory animals, a mosquito survey* was begun on September 19. It was found that *Aedes* mosquitoes, the probable vector among horses, had already practically disappeared for the season. *Culex pipiens* was the mosquito most frequently encountered in the area. Mosquitoes were collected in homes of cases and around stables where fatal disease in horses had occurred, in the hope of discovering some that might be carrying the virus. So far no virus has been recovered from such mosquitoes.

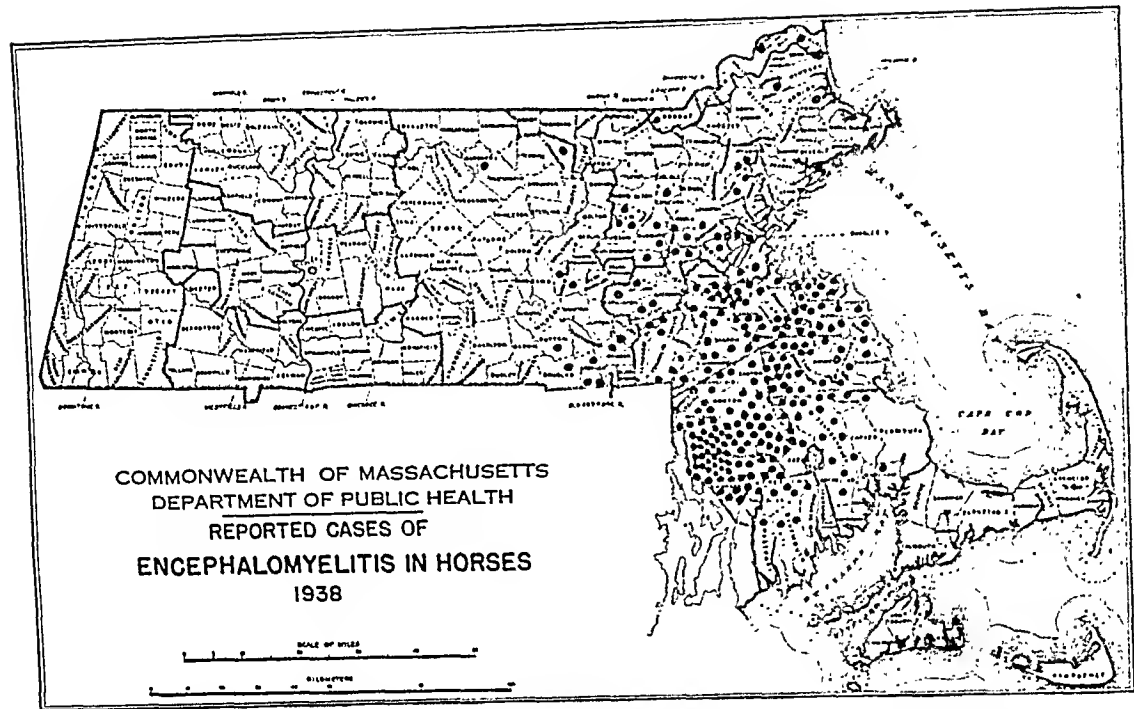
THE DISEASE AMONG HORSES

While the etiology of equine encephalomyelitis in this country was not definitely established until 1930, it is believed that outbreaks had been occurring in previous years. Conditions formerly called forage poisoning and botulism are mentioned by Meyer as probable cases. When the disease became epidemic in Southern California in 1930 and 1931, Meyer and his co-workers isolated the virus⁴ and described the disease⁵ and its pathology.⁶ When cases were recognized in the East it was noted that the case fatality rate was twice as great east of the Appalachian Mountains. This led workers to suspect that a different virus was present in the East. Ten Broeck and Merrill⁷ and Howitt⁸ have demonstrated that the eastern and western strains are immunologically different from each other and also different from the strain causing Borna disease in Europe which had been proved to be due to a virus in 1926.⁹ Strains from Argentina and certain other South American areas behave the same as the western strain. Those from Panama are identical with the eastern strain.

There is very little evidence that the disease has been present in New England in recent years. Veterinarians now believe that cases occurred in Massachusetts in about 1913 and 1914 and that the highly fatal epidemic among horses in 1872 was probably encephalomyelitis. The disease, however, is known to have been present in various states along the Atlantic seaboard from Florida to New York in recent years.

While the disease among horses was not definitely recognized in Massachusetts in 1938 until after the middle of August, it was eventually found that cases had occurred in that state as early as July 12 (one questionable case reported June 4). The number increased with considerable rapidity, reaching a peak in the week ending August 27 and

* Valuable assistance in the survey was rendered by Virgil I. Miles, entomologist, of the U. S. Public Health Service.



rapidly decreasing thereafter (Table I). The number of cases reported to the Massachusetts Division of Livestock Disease Control has now reached 251. This probably does not represent all of the cases, since horses must have died without coming to the attention of veterinarians. Other delayed reports continue to come in. The number of horses on the tax lists in the counties

(Table II) most seriously affected was 5,738 (Bristol, Norfolk, and Plymouth Counties). The total number of cases reported from these counties was 204, which gives an attack rate of about 3.5 per cent (see map). This compares with 10 per cent noted by Meyer⁵ in California at the time the causative organism was first recognized.

The disease appeared to be unusually fatal, very few recoveries being reported. It is estimated that well over 90 per cent of the horses affected have died. The eastern strain has been isolated from the brains of 6 horses. It is definitely known, therefore, that the disease in Massachusetts in both man and horse is due to the eastern strain. Schoening¹⁰ has just been able to produce the disease in a horse with a virus from one of the human cases.

Kelser³ and other workers have demonstrated that several varieties of *Aedes* mosquitoes can transmit either the eastern or western strain of the virus in laboratory animals. Three of the varieties (*Aedes sollicitans*, *Aedes vexans*, and *Aedes cantator*) are usually found in considerable numbers in Massachusetts, and a fourth (*Aedes dorsalis*)

TABLE I
*Reported Cases of Encephalomyelitis in Horses**

<i>Dates of Onset</i>		
<i>Week Ending</i>		<i>Number</i>
June 4		1
July 16		2
23		1
30		1
Aug. 6		3
13		18
20		55
27		68
Sept. 3		56
10		16
17		13
24		8
Oct. 1		2
8		1
15		3
Total		248

* Supplied by Massachusetts Division of Livestock Disease Control. These figures are incomplete. Additional cases are being added to the list as rapidly as investigations justify their inclusion.

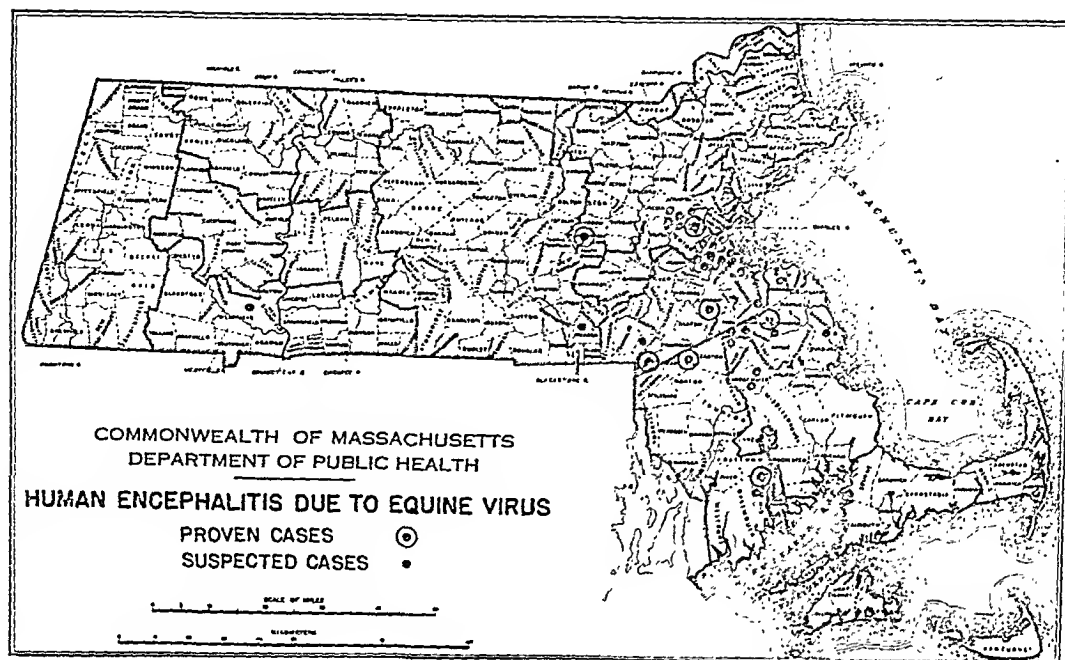


TABLE II
Encephalomyelitis in Horses
*Attack Rate by Counties **

	Horses	Cases	Attack Rate
Barnstable	278	0	
Berkshire	2,960	0	
Bristol	2,647	95	3.6
Dukes	123	0	
Essex	2,467	4	.16
Franklin	2,392	0	
Hampden	2,119	0	
Hampshire	2,625	1	.04
Middlesex	3,887	26	.7
Nantucket	45	0	
Norfolk	1,698	51	3.0
Plymouth	1,393	58	4.2
Suffolk	815	2	.2
Worcester	5,430	11	.2
	28,879	248	

* Compiled from figures supplied by the Massachusetts Division of Livestock Disease Control

has been reported occasionally. If the mosquito is the vector of the natural infection in horses, the spread of the disease in the state can easily be accounted for once a case is introduced.

DISTRIBUTION OF HUMAN CASES

It is, of course, impossible at present to state how many cases of encephalitis due to the equine virus have occurred in the state during the outbreak. Some 38 cases have been under investigation.

These are being classified into 4 groups as information becomes available:

I. Cases proved by isolating the virus from brain tissue taken at post-mortem. Thus far, 8 cases* have been so identified.

II. Cases in which the gross and microscopic pathology is characteristic. Including the 8 cases from which virus was recovered, fifteen cases already examined fall into this group.

III. Recovered patients who show neutralizing antibodies in the blood. Specimens have been collected from several individuals who have survived illnesses in which symptoms compatible with the disease were observed. Four of these have shown high titers of neutralizing antibodies, two were negative and the remainder have not yet been examined.

IV. Patients who have died without an autopsy, but in whom the clinical picture seems suspicious. Additional information on these cases may come from the examination of bloods taken from contacts. If neutralizing antibodies are found, infections caused by the virus in the family will be indicated.

Theoretically there should possibly be a 5th group: cases from which the virus is isolated from the blood or

* Four of these died at the Haynes Memorial Hospital, 2 at the Children's Hospital, 1 at the Truesdale Hospital, Fall River, and 1 at St. Elizabeth's Hospital, Boston.

spinal fluid early in the disease. So far, all specimens of this kind have failed to yield a virus. Meyer¹¹ and Ten Broeck¹² and their coworkers have observed that the virus is found in the blood of experimentally inoculated animals during the period of invasion and rise in temperature, but disappears before any symptoms are observed. Virus has not been recovered from naturally infected horses. It seems unlikely, therefore, that human cases will be seen early enough to obtain virus from the blood.

It is quite certain that some of the cases under investigation will have to be thrown out either because another diagnosis will be established or because evidence will not be sufficient to classify them into any of the 4 groups. This should be borne in mind in interpreting the following tables.

It will be noted (see maps) that there was a marked concentration of cases within the area where the equine disease was prevalent. Search was made among hospitals and physicians in other parts of the state to make sure that cases were not being overlooked elsewhere, but no additional ones were found. The earliest cases under investi-

TABLE III
Human Cases under Investigation
Dates of Onset

<i>Week Ending</i>	<i>Suspected Cases</i>	<i>Proved Cases</i>
Aug. 13	1	0
20	1	0
27	4	0
Sept. 3	9	4
10	8	2
17	6	1
24	4	0
Oct. 1	4	1
8	..	..
15	1	..
Totals	38	8

gation had onsets (Table III) early in August and the peak occurred early in September, a week later than the peak of the disease among horses.

The cases are fairly evenly divided between the sexes (Table IV). The age distribution, on the other hand, is quite striking. Children under 2 years seem particularly vulnerable, 37 per cent of the cases being in that group. One-half were under 5, and 69 per cent under the age of 10.

The families in which cases have occurred have been visited and epidemiological records obtained. Suspicious illnesses have occurred in some, but multiple or secondary cases of frank disease in families have not been found.

TABLE IV
Human Cases under Investigation
Age and Sex

Age	Suspected Cases						Proved Cases
	Male		Female		Total		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	
Under 1	3	2	5	4	8	6	1
1	1	..	5	3	6	3	2
2	2	2	1	..	3	2	1
3	..	..	1	1	1	1	..
4	..	..	1	1	1	1	..
0- 4	6	4	13	9	19	13	4
5- 9	6	2	1	0	7	2	2
0- 9	12	6	14	9	26	15	6
10-19	2	2	3	3	5	5	1
20-29	..	..	1	0	1	0	..
30-39	..	..	..	0	..	0	..
40-49	..	..	1	1	1	1	..
50-59	4	3	1	1	5	4	1
Totals	18	11	20	14	38	25	8

No connection between cases, indicating contact infection, has been traced. Contact with horses has been only casual in many of the cases and no contact at all can be discovered in others. No epidemics among small animals have been observed in the vicinity of the households. Rhode Island Red chickens were found at, or in the vicinity of, many households but, since a large proportion of the cases lived in the more sparsely settled areas, this is probably to be expected. Practically every family had taken trips to nearby communities on motor rides, picnics, or visits to beaches.

Mosquitoes were unusually prevalent this summer because of heavy rains in July, and there is a universal history of mosquito bites. In a few cases, unusual reactions to such bites have been observed. This probably means that many varieties of mosquitoes were present this year since no local reactions due to the equine virus have as yet been described as occurring.

CLINICAL DESCRIPTION OF CASES *

The following summary gives the most common symptoms and signs which characterized the disease as seen at the Boston Children's Hospital and the Haynes Memorial Hospital. Cases occurring in other hospitals were similar in most details.

The onset in infants was sudden, with fever, irritability or drowsiness, cyanosis, and convulsions. In older children and in the one adult the symptoms were of slower onset, from 4 to 10 days. In 2 cases there was a definite remission of the symptoms lasting for 1 day. Headache, frontal in character, and dizziness were the first complaints in the older patients. In 2 infants diarrhea preceded the other symptoms, while vomiting occurred in

half of the cases. All patients were semi-comatose to comatose on admission, and the majority showed continued tremors or muscular twitchings. Rigidity of the neck was a constant feature, as was a tense anterior fontanelle in the infants.

Evidences of an upper respiratory infection, *e.g.*, pharyngitis and otitis media simplex, were found in few of the cases. The suppression of the cutaneous reflexes was constant in the comatose patients, while the Kernig and kindred signs varied markedly. Facial palsies were seen in 3 cases, one of which had in addition a hemiplegia.

Outside of the fact that the pupils reacted sluggishly to light and one patient complained of photophobia, no abnormal eye findings were noted.

The temperature was invariably high, 102 to 104°, and in the fatal cases continued to rise. Where recovery took place the fever fell by lysis, becoming normal in 4 or 5 days.

The spinal fluid showed increased pressure, average 240 mm., hazy to ground-glass in appearance; the cell count varied from 200 to 2,000, of which 60-90 per cent were polys. Total protein was high, 95-185 mg.; sugar normal or slightly increased. Smears and cultures showed no organisms.

The blood showed the same polymorphonuclear response. The white count varied from 14,600 to 65,900, the percentage of polys from 75 to 90. The counts above 35,000 were in children who also had whooping cough.

When the patient lived over 2 or 3 days, there was a drop in both the spinal fluid and white blood counts, with a change to the mononuclear type of cell.

Convulsions and muscular twitchings marked the course of the disease. In the infants a peculiar edema developed about the eyes and in the upper extremities. Cyanosis was marked in all cases.

Deep coma from which the majority

* This summary was obtained from Dr. Charles F. McKhann and Dr. E. C. Smith.

of patients never aroused developed shortly after admission. When a patient survived the acute stage, coma and more or less rigidity of the muscles persisted for many days. An occasional patient showed gradual but slow improvement, returning apparently to normal.

Some cases suspected of being due to the virus have made complete recoveries, but it appears that certain other cases will show paralyses, mental changes, and other permanent residuals.

GROSS AND MICROSCOPIC PATHOLOGY *

Severe edema and congestion of the brain and cord, flattening of the convolutions and the formation of pressure cones in the cerebellum were conspicuous gross findings. On microscopic examination all parts of the brain showed some degree of involvement, with maximum changes in the brain stem. The lower cord was rarely involved except for edema and congestion. The anterior horn cells were spared.

The microscopic changes may be divided into several groups: (1) perivascular accumulations of large numbers of polymorphonuclear and large mononuclear cells; (2) diffuse slight infiltration of the meninges by the same types of cells; (3) numerous scattered focal areas of nerve cell destruction with infiltration by polymorphonuclear and microglial cells; and (4) small thrombi in vessels which often exhibited intramural degeneration and fibrin deposition.

The predominant type cell in the exudative response changed to the large mononuclear cell as the acute reaction subsided in cases where 6 to 20 days passed between the onset of important symptoms and death. After the longer duration of the disease, the perivascular infiltration and meningeal reaction almost disappeared, the areas of neuronophagia were less prominent, and

the main picture became one of removal of debris and repair.

No bacteria were found by cultural methods or by histologic examination of the brain with the aid of appropriate stains in one patient who died 48 hours after the onset of symptoms.

Widespread congestion was present in the viscera. Numerous small thrombi were found on microscopic examination in many organs of the body. No bacteria could be demonstrated in relation to these thrombi. Severe pulmonary edema and congestion, probably secondary to the inflammatory process in the brain stem, were present in patients in whom no secondary bacterial infection could be demonstrated.

In summary, examination of the central nervous system demonstrated a severe, diffuse acute meningo-encephalitis, characterized chiefly by an intense polymorphonuclear and mononuclear cell infiltration in the perivascular spaces and to a minor degree in the meninges, and by widespread destruction of nerve cells.

DISCUSSION

As early as 1931, Meyer⁵ suggested the possibility of humans contracting the equine disease. He noted in 3 individuals illnesses suspected of being due to the virus. The brief account of symptoms and findings in the fatal case is consistent with the clinical picture seen in the Massachusetts cases, particularly the finding of polymorphonuclears in the spinal fluid. The 8 cases in Massachusetts, however, are the first human infections definitely proved to be due to the equine virus. An entirely new public health problem has been opened up and the equine disease assumes an added importance.

The disease in the severer form is sufficiently different from the usual varieties of encephalitis to be recognized clinically. If some of the milder cases under investigation prove to be

* This summary was obtained from Dr. Sidney Farber.

due to the same virus, and particularly if the existence of subclinical infections can be established, the recognition of all cases will be difficult unless laboratory means of verifying the diagnosis can be found. A routine test within the scope of the public health laboratory would be invaluable. Whether the neutralization test or some similar procedure will be the solution is yet to be demonstrated.

A number of other problems in regard to the disease await elucidation. We need to know if other reservoirs beside the horse are important. In fact, Ten Broeck¹² and his coworkers suggest that the horse may not be the primary host, both because the disease is so highly fatal and because the virus disappears from the blood so early. Fothergill¹³ has just isolated the eastern virus from a dead pigeon from an area where many pigeons have been dying this summer. It yet remains to be satisfactorily demonstrated that the mosquito transmits the natural infection among horses. The importance of other insects, especially the recently incriminated tick, as vectors of the disease awaits investigation.

The need of having all cases of encephalitis reported to health departments is emphasized by the presence of the equine infections in humans. The Massachusetts Department of Public Health has now made all cases of "Infectious Encephalitis" reportable instead of the former designation of "Encephalitis Lethargica."

SUMMARY

1. Eight cases of human encephalitis have been proved to be due to the eastern virus of equine encephalomyelitis.

2. The clinical picture and pathological

findings in these cases appear to be sufficiently characteristic to make recognition of the disease possible.

3. While young children seem to be particularly vulnerable, adults are occasionally affected.

4. The case fatality appears to be high; 25 of the 38 cases under investigation died.

5. The attack rate among horses was low (3.5 per cent) but the case fatality was high (over 90 per cent).

REFERENCES

1. Fothergill, L. D., Dingle, J. H., Farber, S., and Connerley, M. L. Human Encephalitis Caused by the Virus of the Eastern Variety of Equine Encephalomyelitis. *New Eng. J. Med.*, 219:411 (Sept.), 1938.
2. Webster, L. T., and Wright, F. H. Recovery of Eastern Equine Encephalomyelitis Virus from Brain Tissue of Human Cases of Encephalitis in Massachusetts. *Science*, 88:305-306 (Sept.), 1938.
3. Kelser, R. A. Transmission of the Virus of Equine Encephalomyelitis by *Aedes Taeniorhynchus*. *J. Am. Vet. M. A.*, 92:195-203, 1938.
4. Meyer, K. F., Haring, C. M., and Howitt, B. The Etiology of Epizootic Encephalomyelitis of Horses in the San Joaquin Valley. *Science*, 74:227-228, 1931.
5. Meyer, K. F. A Summary of Recent Studies on Equine Encephalomyelitis. *Ann. Int. Med.*, 6:644-654 (Nov.), 1932.
6. Larcell, O., Haring, C. M., and Meyer, K. F. Histologic Changes in Central Nervous System following Encephalomyelitis (in Horses). *Am. J. Path.*, 10:361-374, 1934.
7. Ten Broeck, C., and Merrill, M. H. A Serological Difference between Eastern and Western Equine Encephalomyelitis Virus. *Proc. Soc. Exper. Biol. & Med.*, 31:217-220 (Nov.), 1933.
8. Howitt, B. F. Immunological Study in Laboratory Animals of Thirteen Different Strains of Virus. *J. Immunol.*, 29:319-341 (Oct.), 1935.
9. Nicolau, S., and Galloway, I. A. Borna Disease and Enzootic Encephalomyelitis of Sheep and Cattle. Med. Research Council, Report No. 121, 1928-29, pp. 7-90.
10. Schoening, H. W., Giltner, L. T., and Shahan, M. S. Equine Encephalomyelitis Produced by Inoculation of Human Encephalitis Virus. *Science*, 88:409-410 (Oct.), 1938.
11. Meyer, K. F., Wood, F., Haring, C. M., and Howitt, B. The Susceptibility of Non-immune and Hyperimmunized Horses and Goats to Eastern, Western and Argentine Virus. *Proc. Soc. Exper. Biol. & Med.*, 32:56-58, 1934-35.
12. Ten Broeck, C., Hurst, E. W., and Traub, E. Epidemiology of Equine Encephalomyelitis in the Eastern United States. *J. Exper. Med.*, 62:677-685 (Nov.), 1935.
13. Fothergill, L. D., and Dingle, J. H. Paper in press.

NOTE: Articles have been chosen partly because of detailed bibliographies.

Rocky Mountain Spotted Fever and Tick Survey in Iowa*

CARL F. JORDAN, M.D., C.P.H., F.A.P.H.A.

*Director, Division of Preventable Diseases, and Epidemiologist,
Iowa State Department of Health, Des Moines, Ia.*

ROCKY Mountain spotted fever, now known to have widespread distribution in the United States, has in recent years assumed greater significance for the northern as well as the southern central states.

REPORTED IN CENTRAL STATES

Hampton and Eubank¹ of the U. S. Public Health Service, recently reported that during the 5 year period 1933-1937, cases of spotted fever totalling 2,190 were notified for the United States as a whole. The Mountain and Pacific states reported 65.5 per cent and the South Atlantic group of states, 27.4 per cent of all cases. Of the remaining 7.1 per cent, 5.4 per cent occurred in the North and South Central States, and 1.7 per cent in the New England and Middle Atlantic states. In the period 1933-1937, the East and West North Central states reported 80 cases with 17 deaths, as compared with 36 cases and 10 deaths in the East and West South Central states. The 4 groups comprising the Central states, reported 47 cases in 1938 (to September 1), representing more cases than have been reported in any previous year.

The first case of Rocky Mountain spotted fever in Iowa was officially re-

ported to the State Department of Health in June, 1933, by C. N. Freligh, M.D. of Waucoma, Fayette County. Much credit is due to the attending physician who is first to recognize a disease which previously was not known to occur in his state. To date, 38 cases of spotted fever have been officially reported in Iowa.

CLINICAL MANIFESTATIONS

Excellent accounts of the clinical manifestations of Rocky Mountain spotted fever have been published in recent years by Rumreich, Dyer, and Badger² of the U. S. Public Health Service, by R. R. Parker,³ Director, Rocky Mountain Laboratory of the U. S. Public Health Service at Hamilton, Mont., by Litterer⁴ in Tennessee, by Stroy,⁵ Floyd⁶ and others in Iowa, and by many other physicians and investigators. In the cases studied in the state, onset of illness has usually been sudden, sometimes beginning with a chill. Symptoms and signs include fever, headache, vomiting, abdominal pain, neck stiffness, weakness or prostration, and drowsiness which may progress to coma. On the third day, as a rule, reddish spots, irregular in outline and varying in size from one to several millimeters, appear about ankles, wrists, and forehead, later extending to the body and becoming generalized. The color of the lesions deepens with rise in temperature. Macules later become

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 26, 1938.

petechial in character and remain visible for 1 week to 10 days or longer. Brownish discoloration occurs before the eruption fades and disappears. Increased reflexes and ankle clonus are, when present, significant findings referable to the central nervous system.

Some of the cases have been of comparatively mild, others of severe type. Nine deaths have been recorded in Iowa during the past 6 years, a case fatality rate of nearly 24 per cent. Three deaths from this cause occurred in 1937, no fatalities in 1938. One patient recovered from the acute illness, but developed epileptiform attacks, a sequela which ran a progressive course with fatal outcome 3 years after onset of symptoms.

In the 38 cases reported, clinical findings were confirmed in 27 instances by positive Weil-Felix agglutination tests, varying in titer from 1-160 to 1-1,280. In 4 cases, diagnosis was based on characteristic clinical findings plus the history of a tick having been removed from the body shortly before illness. Diagnosis in the remaining 7 instances, was based on the clinical picture, together with the history of possible exposure to tick bite. An additional aid in recognition of some of the early cases which occurred, was the demonstration of immune substances in the patient's serum, by means of the protection test, completed in the Rocky Mountain Laboratory of the U. S. Public Health Service.

EPIDEMIOLOGICAL FACTORS

Among 38 cases reported to the Iowa State Department of Health in the 6 year period 1933-1938, 25 patients were males, 13 were females. Nearly half of the cases were children between 1 and 9 years; nearly a third were persons from 40 to 80 years of age. The youngest patient was 17 months, the oldest 79 years.

Four of the 38 patients had onset of

symptoms in May, 18 in June, 11 in July, 4 in August, 1 in September. Onset of illness of the earliest case in the season was May 16, of the latest in the season, September 6.

Cases were reported from 18 counties, representing widely scattered sections of northeastern, eastern, southeastern, southern, southwestern and central Iowa.

That Rocky Mountain spotted fever represents a distinctively rural health hazard is indicated by the cases thus far reported. In the series of 38 patients under consideration, exposure in 32 occurred on a farm or in a rural area, including 2 boys who lived in town but were visiting relatives on the farm at the time of illness. Five other patients were urban residents who gave a history of direct or possible exposure to ticks. One patient was a packing house employee who might have been exposed to ticks through the handling of hides or through proximity of his residence to open country.

OCCURRENCE OF MULTIPLE CASES

On 3 occasions, 2 members of a family had onset of illness at the same time. In a 4th instance reported by Stroy,⁵ 3 children in the same farm household took sick within a few days of each other. The youngest child died, the second was severely ill, while the oldest had a mild attack, the nature of which under other circumstances might easily have been overlooked.

In 1937, an outbreak of Rocky Mountain spotted fever occurred among Indians on the Sac and Fox Reservation in Tama County. Six cases were reported within several weeks by Ira Nelson and A. A. Pace, physicians in the Indian service. Two of the patients were Indian women, both of whom recovered; 4 cases were children, of whom 2 died. All the patients had been directly exposed during the days immediately preceding illness, to the common dog tick, *Dermacentor variabilis*.

Control measures on the reservation were directed primarily against dogs, many of which were heavily infested with ticks. Special efforts were put forth to rid dogs, in so far as possible, of tick infestation. Treatments with spotted fever vaccine were administered to many of the 450 Indians. Prior to the opening of the tick season in 1938, control measures were renewed and spotted fever vaccine was given to about a third of the Indians, including most of the children. The vaccine was forwarded through courtesy of Dr. Parker, from the Rocky Mountain Laboratory at Hamilton, Mont.

RESULTS OF TICK SURVEY

During 1936-1937, a tick survey was carried out under auspices of the Iowa State Department of Health, instituted by Walter L. Bierring, M.D., Commissioner, in collaboration with Carl J. Drake, State Entomologist, and R. R. Parker, Director of the Rocky Mountain Laboratory.

In June and July, 1936, ticks were collected by Dean Eckhoff, Assistant Consulting Entomologist, in 35 counties of the state. Of the ticks forwarded from Iowa to the Montana laboratory, about 350 arrived in good condition. The report from Dr. Parker⁷ stated that all specimens belonged to the species *Dermacentor variabilis*, or the common dog tick. Tests carried out on guinea pigs and consisting of the injection of tick substance from 30 groups of ticks, proved negative for evidence of spotted fever virus. *Bacterium tularense* was recovered from ticks collected in 3 counties in southeastern Iowa, 2 of the 3 batches of ticks having been removed from dogs.

The tick survey was resumed in the late spring and early summer of 1937, and included 18 counties in the southern half of the state. Ticks collected by dragging the vegetation with canvas and designated "drag" ticks, totalled

3,026. Engorged ticks removed, chiefly from dogs but also from cows, horses and smaller wild animals, numbered 2,832. The conduct of the survey afforded opportunity to make some interesting observations pertaining to habits of the American dog tick and regarding some of the animal hosts preferred by the nymphal and adult ticks. Mr. Eckhoff's report reads in part as follows⁸:

Concerning the host I can positively list rusty fox squirrel, cottontail rabbit, and woodchuck as being host to the last stage nymphal and adult ticks in Iowa. Several smaller mammals were examined but I did not find any stage of the tick. The domestic animal host list includes horse, cow, sheep, goat, dog, and infrequently, cat.

Mr. Eckhoff observed that ticks were seldom found in the woods away from paths or roads but

... were concentrated on blue grass, sweet clover, weeds and shrubs growing through the dead leaves in roadside ditches.

It is significant that among the ticks collected in Iowa during 1937 and tested in the Montana laboratory, ticks from the Tama Reservation and from the farm in Clarke County where 3 children in the same home developed spotted fever, proved to harbor the virus of Rocky Mountain spotted fever.

RESULTS OF WEIL-FELIX TESTS

Agglutination Tests on Human Serum—In connection with the outbreak of Rocky Mountain spotted fever which occurred among the Indians in Tama County in 1937, efforts were made to determine whether apparently healthy persons might show evidence of latent infection resulting from exposure to spotted fever virus. The Weil-Felix test with the use of *B. proteus* X₁₉ as antigen, was performed on 189 serum specimens obtained from Indian men, women, and children, several weeks following the outbreak. Although 4 serum specimens showed agglutination

in the 1-80 dilution, these reactions were not sufficiently high to be regarded as diagnostic. The Weil-Felix tests were performed under the capable direction of I. H. Borts, M.D., Assistant Director of the State Hygienic Laboratory.

Agglutination Tests on Serum of Dogs—A house-to-house canvass on the Indian Reservation was conducted by Frank J. Condon, M.D., Medical Director of Health District No. 2, assisted by Mr. Eckhoff. Among about 100 dogs belonging to the Indians, 60 were found to be infested. Ticks totalling 1,880 were removed from all of the dogs. Blood specimens were taken from 80 dogs and sent to the State Hygienic Laboratory. The antigens used by Dr. Borts for the Weil-Felix tests included the Washington strain of proteus X₁₉ and live strains of OX₁₉ Parker and OX₂ Parker. The OX₂ antigen is regarded as being very sensitive, yielding higher titers than other strains. Although 5 of the sera produced agglutination of the Parker OX₂ antigen in dilutions 1-160, reactions with the two other strains were not sufficiently high to be regarded as diagnostic. Six of the serum specimens showed a doubtful reaction for tularemia 1-40 and two specimens were positive for this infection in the 1-80 dilution.

DISCUSSION

In the 38 cases of Rocky Mountain spotted fever reported in Iowa in recent years, there is evidence in 14, or 37 per cent of the cases, to indicate that dogs play an important part in relation to the spread of spotted fever from infected ticks to human beings. Dogs serve as a drag net in gathering ticks and bringing them close to children and adults in the home. As an example, in an Indian home in which 2 children developed spotted fever, ticks numbering 275 were taken from 4 dogs belonging to the family. Experiments reported by Badger⁹ show that dogs

are susceptible to spotted fever virus. It is possible that further investigation may demonstrate that the dog as a host of *Dermacentor variabilis*, plays a more significant part than is now realized, in the transmission of Rocky Mountain spotted fever to man.

SUMMARY AND CONCLUSIONS

1. More complete reporting of Rocky Mountain spotted fever is dependent upon attending physicians who are spotted fever conscious and upon repeated laboratory tests for confirmation of the clinical diagnosis.
2. Educational measures need to be continued, so as to make people who live in or frequent rural areas, more tick conscious during the tick season.
3. Results are reported of a tick survey in Iowa.
4. More precautions need to be exercised to minimize the hazard of transmission of tick-borne disease through the agency of tick infested dogs.
5. It is desirable that there be further study of the common dog tick, *Dermacentor variabilis* and of the epidemiology of Rocky Mountain spotted fever in the Central states.

NOTE: Special acknowledgment is made to R. R. Parker, Director, Rocky Mountain Laboratory of the U. S. Public Health Service, for his willingness to undertake the expensive and laborious task of testing some of the ticks collected in Iowa, for sending spotted fever vaccine and for his valuable suggestions relating to the subject of Rocky Mountain spotted fever.

REFERENCES

1. Hampton, Brock C., and Eubank, Harry G. Rocky Mountain Spotted Fever. *Pub. Health Rep.* 53:984-990 (June 17), 1938.
2. Rumreich, A., Dyer, R. E., and Badger, L. F. The Typhus Rocky Mountain Spotted Fever Group. *Pub. Health Rep.*, 46:470-480 (Feb. 27), 1931.
3. Parker, R. R. Rocky Mountain Spotted Fever. *J.A.M.A.*, 110:1185-1188 (Apr. 9), 1938; and 110:1273-1278 (Apr. 16), 1938.
4. Litterer, William. Rocky Mountain Spotted Fever (Eastern type) in the Southern States. *South. Med. J.*, 26:407-415 (May), 1933.
5. Stroy, H. E. Rocky Mountain Spotted Fever. *J. Iowa State Med. Soc.*, 27:293-294 (July), 1937.
6. Floyd, M. L. Rocky Mountain Spotted Fever. *Ibid.*, 294-296.
7. Parker, R. R. Communication to the Iowa State Department of Health.
8. Eckhoff, Dean E. Report of Tick Survey to the Iowa State Department of Health.
9. Badger, L. F. Rocky Mountain Spotted Fever. Susceptibility of the Dog and Sheep to the Virus. *Pub. Health Rep.*, 48:791-795 (July 7), 1933.

The Probable Typhoid Carrier Incidence in Mississippi*

A. L. GRAY, M.D., M.P.H.

*Director, Division of Preventable Disease Control, State Board
of Health, Jackson, Miss.*

THIS paper is a part of the result of an honest effort to determine what the typhoid fever control problem is and may be expected to be in Mississippi. For this effort to be even partially successful, it was desirable to know the approximate incidence of typhoid carriers in Mississippi. No refined statistical maneuvers were used in coming to conclusions, and it is admitted that more accurate methods might have been used. Facts presented were accumulated over a period of 4 years' experience in doing the proverbial "shoe-leather," or I might say cotton-field, epidemiological studies on typhoid fever in Mississippi.

It has long been recognized that typhoid carriers play an important part in maintaining the incidence of typhoid fever in a given area. A typhoid fever control program to be ultimately successful must embrace thorough persistent search for carriers and provision for continued adequate supervision of them. Plans for a control program should be based upon several factors, among which are current and past incidence of the disease and incidence of typhoid carriers. Obviously the inci-

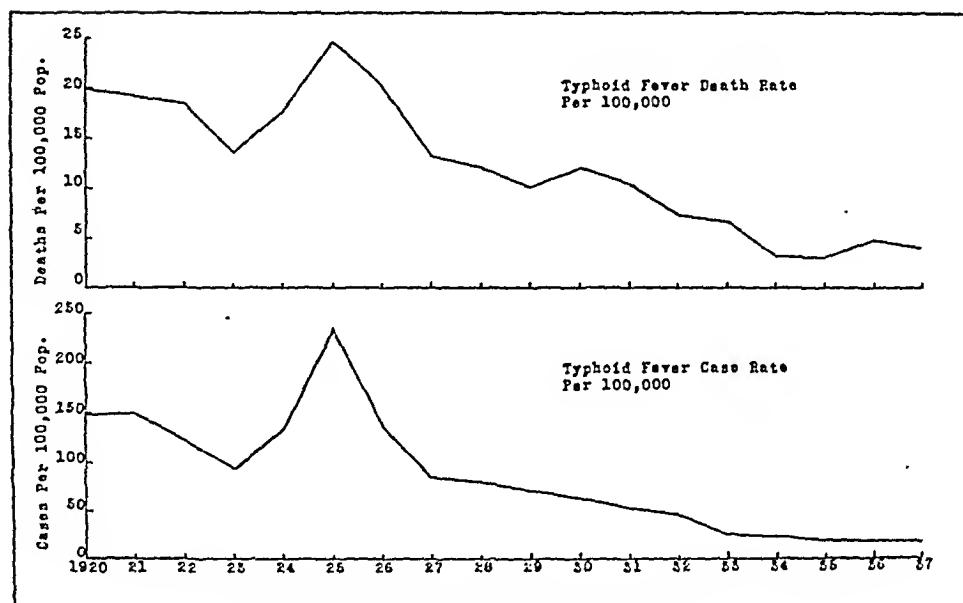
dence of typhoid carriers in an area is dependent upon the past prevalence of typhoid fever in that area. The difficulty is to determine what the actual incidence in the area has been and to know just what percentage of those having the disease become permanent carriers. Neither of these problems has been satisfactorily solved.

Mississippi is in the heart of the old South, along the east bank of the lower Mississippi River. It has a population of slightly over 2,000,000 of which about 49 per cent is white and 51 per cent colored. It is primarily an agricultural area in which cotton production predominates. Lumber manufacture has been and remains a prominent source of income. A very large percentage of the population lives in rural areas and small towns of less than 1,000 population. Because of the relative simplicity in methods of living epidemiological problems are much less complex than in metropolitan areas. About 30 per cent of the population has some type of comparatively safe excreta disposal. A smaller percentage has protected water supply.

The reported incidence of typhoid fever in Mississippi is indicated in Table I and Figure I which show the reported case and death rates per 100,000 population from 1920 to 1937.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 26, 1938.

FIGURE 1



Typhoid Fever Case and Death Rates per 100,000
in Mississippi, 1920 - 1937

Experience in epidemiological study of typhoid fever in Mississippi leads the writer to believe that the actual incidence of the disease has been between 30 and 40 per cent higher than is indicated by reports.

TABLE I

Typhoid Fever Cases and Deaths, Case and Death Rates per 100,000 Population in Mississippi, 1920-1937

Year	Cases	Case Rates	Deaths	Death Rates
1920	2,644	147.8	342	19.2
1921	2,665	147.9	348	19.9
1922	2,230	121.5	337	18.4
1923	1,690	91.0	252	13.6
1924	2,470	131.4	330	17.5
1925	4,415	232.0	470	24.6
1926	2,613	135.7	390	20.3
1927	1,597	81.9	255	13.1
1928	1,517	77.0	237	12.0
1929	1,315	65.9	197	9.9
1930	1,239	61.4	238	11.9
1931	1,059	51.9	211	10.4
1932	928	45.1	145	7.1
1933	529	25.4	135	6.5
1934	490	23.0	66	3.1
1935	366	17.3	61	2.9
1936	377	18.2	96	4.7
1937	344	15.8	77	3.8

Physicians in Mississippi have looked upon typhoid fever as a disease which always causes one to be ill for several weeks. There is no question that many people have typhoid fever with only slight indisposition for a few days. Such cases have either not been seen by a physician or have not been diagnosed.

In 1937, 82 cases of typhoid fever were definitely diagnosed in 11 counties having full-time local health service. Of these 82 cases, 32 were located and diagnosed through the county health officers' epidemiological studies of cases reported by physicians. In other words, over 39 per cent of that group of cases would not have been reported without the investigative efforts of health officers. This type of work has developed within the past 4 years. This is a very definite indication that the actual typhoid fever incidence has been and remains much higher than the reported incidence would indicate.

The method chosen to determine the approximate typhoid carrier incidence is briefly described together with the

TABLE II
Total Surveyed by Age Groups and Race

	0-4	5-14	15-24	25-34	35-44	45-54	55 and Over	Total
White	1,150	2,439	1,812	1,308	1,082	774	809	9,374
Colored	1,253	2,451	1,868	1,281	956	728	666	9,203
Total	2,403	4,890	3,680	2,589	2,038	1,502	1,475	18,577

conclusions reached. The conclusions are based upon the estimated number of people now living in Mississippi who give a history of typhoid fever and the percentage of the cases resulting in a permanent carrier state. To determine the number of people now living with a typhoid fever history, as diagnosed by physicians, a random sample of homes was surveyed, involving 18,577 people in 16 counties with a total population of 603,000. The homes surveyed were without regard to knowledge of previous incidence in the communities. For each county, the survey was planned so as to reach about 3 per cent of the white and colored population respectively. Urban and rural populations were surveyed so as to include proportionate shares of these groups. As nearly as possible, every fifth home was surveyed in several communities in each county and in sections of towns in these counties. It was impossible to make a true random sampling survey, but efforts were made to approach this as nearly as possible.

A responsible person, usually the wife, was questioned as to the typhoid history of each member of the family. Only those were counted as having had typhoid fever who stated that their physician made this diagnosis.

Figure II indicates the area covered. Counties surveyed were those in which other work was being done, the survey being a secondary objective.

Table II shows the number of people surveyed by age group and race.

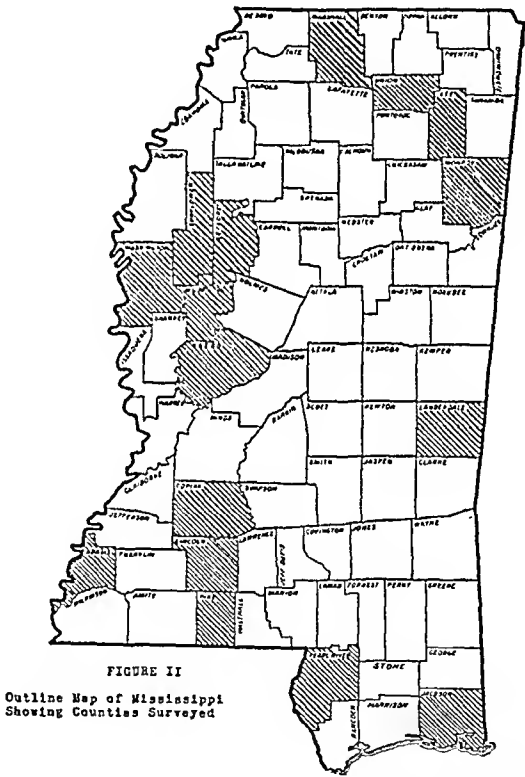


Table III gives the number of each age and race group with a history of typhoid fever.

TABLE III
Number of Those Surveyed with History of Typhoid Fever

	0-4	5-14	15-24	25-34	35-44	45-54	55 and Over	Total
White	1	25	46	105	172	151	217	717
Colored	7	108	149	146	158	139	123	830
Total	8	133	195	251	330	290	340	1,547

TABLE IV

Per cent of Each Age and Race Group with History of Typhoid Fever

	0-4	5-14	15-24	25-34	35-44	45-54	55 and Over
White	0.089	1.39	2.53	8.00	15.9	19.5	26.7
Colored	0.55	4.00	8.00	11.39	16.5	19.09	18.62

Table IV shows the per cent of each age group by race, with a history of typhoid fever.

Table V gives the estimated population of the state as of July 1, 1935, by age groups and race, based upon the 1930 Census Bureau figures and the arithmetic increment from 1920 to 1930; also the per cent and number of each age group and race of the state having a history of typhoid fever and now living.

From the foregoing survey and calculations it is found that in 1935 there were living in Mississippi 183,230 people giving a history of typhoid fever as diagnosed by physicians.

This method of determining the number of living people with history of typhoid fever is liable to several sources of error—one, the fact that no one knows how many of those with history of typhoid fever were properly diagnosed. It is known that comparatively few physicians have used dependable laboratory diagnostic aids in

dealing with typhoid fever. The Widal reaction has been largely depended upon and, in Mississippi, this has comparatively little diagnostic significance.

Experience leads to the conclusion that there have been many cases of typhoid fever that were not seen and reported by physicians. Another large group of cases were seen by physicians but diagnosed by nonspecific terms—such as colitis, flux, malaria fever, etc. It is believed that these two groups far exceed the cases classed as typhoid fever. This is more clearly indicated by the fact that less than 5 cases of typhoid fever for each typhoid fever death were reported in the period 1933 to 1937. It is believed that there are probably 12 to 14 cases per death rather than 8 as reported.

There is no definite proof that there is not a great deal of variation geographically, by race, or by severity of attack as to the percentage of cases developing the permanent carrier state. It is apparent, however, that much of

TABLE V

Age Group Distribution of Population and Recovered Cases of Typhoid Fever Now Living in Mississippi as of July 1, 1935

Age Group	White			Colored		
	Population	Per cent History of Typhoid	No. Living Recovered Cases	Population	Per cent History of Typhoid	No. Living Recovered Cases
0-4	120,392	0.089	107	123,143	0.55	677
5-14	239,368	1.39	3,327	240,499	4.00	9,619
15-24	222,272	2.53	5,623	232,772	8.00	18,621
25-34	151,269	8.00	12,101	153,241	11.39	17,454
35-44	123,250	15.9	19,596	117,532	16.5	19,363
45-54	102,530	19.5	11,893	92,735	19.09	17,703
55 and Over	110,966	26.7	29,627	88,719	18.62	17,519
Total	1,070,047		82,274	1,048,461		100,956

the difference in opinion as to the percentage becoming carriers is due to difference in efficiency of laboratory technic, as well as many other factors too numerous to mention. It has been the experience of workers in Mississippi that results of examination of stool specimens for *B. typhosus* are dependent in no small degree upon the type and age of the specimen.

It is the policy of the Mississippi State Board of Health to class an individual as a permanent typhoid carrier only after securing at least two positive cultures as late as 1 year after onset of the disease. In the past 3 years 286 cases of typhoid fever were definitely diagnosed by finding *B. typhosus* in the blood, stool, or urine. Of the 286 cases 42 died, leaving 244 cases which were followed up with frequent release stool and urine cultures until at least two consecutive negative results were obtained, made not less than a week apart and after recovery. Eight of the 244 continued to excrete typhoid bacilli in stool as late as 1 year after onset, as a result of which they were listed as permanent carriers. Accordingly, 3.27 per cent of this group became permanent carriers.

Findings of different investigators have varied from less than 2 per cent to 7 per cent of recovered cases developing into the permanent carrier state. Several of the 244 cases excreted the organisms 3 to 9 months after recovery and ceased doing so as determined by 12 consecutive monthly specimens.

The survey indicated that there are at least 183,230 recovered cases of typhoid fever living in Mississippi. If we assume this is approximately correct and that 3.27 per cent of them became

permanent carriers, there are now in Mississippi approximately 5,991 carriers who subject the rest of the population to constant danger by spreading typhoid organisms.

The above figures mean that for each 100,000 people of the 2,080,000 living in Mississippi there are about 288 typhoid carriers.

This, together with many other facts, indicates that the problem of typhoid fever control has not been solved nor will it be solved for many years to come.

SUMMARY AND CONCLUSIONS

1. A random survey of 18,577 people in 16 counties in Mississippi revealed that 1,547 gave a history of having had typhoid fever as diagnosed by physicians.

2. Those surveyed were classified by age group and race as to total number in each group, and number in each group giving history of typhoid fever. These classifications were used to determine the percentage in each age and race group with a history of having had typhoid fever. The percentages thus obtained were applied to the total age and race group populations of the state to find the total number of people now living in Mississippi with a history of typhoid fever. According to these calculations there are 183,230 people in the state with such history.

3. Of 244 proved cases of typhoid fever in Mississippi 8, or 3.27 per cent of the group, became permanent carriers and were excreting *B. typhosus* more than 1 year after onset. Applying this percentage to the total recovered cases living in the state, 183,230, there are about 5,991 typhoid carriers in the state at present, or 288 carriers per 100,000 population.

American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 28

December, 1938

Number 12

MAZŮCK P. RAVENEL, M.D., *Editor*

AUGUSTA JAY, *Editorial Associate*

REGINALD M. ATWATER, M.D., *Managing Editor*

Editorial Board

THE MANAGING EDITOR, *Chairman*

PROF. IRA V. HISCOCK

KENNETH F. MAXCY, M.D.

ARTHUR P. MILLER, C.E.

HARRY S. MUSTARD, M.D.

OUR SIXTY-SEVENTH ANNUAL MEETING

MANY of us have visited Kansas City in the past. Those who had not done so were prepared by even the very imperfect sketch in our issue of August to be entertained and charmed. Not only were we not disappointed but our fondest expectations were more than fulfilled.

Our meeting place was the Municipal Auditorium, one of the largest and most perfectly arranged buildings of its kind in the country, with every facility for rooms, exhibitions, and entertainment. It is very near the leading hotels which furnished abundant accommodations for gatherings of practically any size. While the city possesses every convenience for a scientific or business meeting, the residential district, with its many parks, beautiful trees, and magnificent residences, adds a charm which none can ever forget.

As usual, a number of related societies met at the same time, such as the American School Health Association, American Social Hygiene Association, Association of Women in Public Health, Conference of State Laboratory Directors, Conference of State Sanitary Engineers, and the International Society of Medical Health Officers. Most of these had their special sessions the day before our Association convened, as well as a number of joint sessions with our sections.

The program of our own meeting was an interesting one. In the ten different sections of which our Association is composed, many subjects of great general public health interest were discussed by specialists. It may not be amiss to call particular attention to a few items, but this is done without any disparagement to other papers and these are mentioned simply because they contained something new. Perhaps the most important single item was the discovery that the virus of encephalitis of horses, at least one strain of it, was transmissible to man, and from Massachusetts we had a report from Dr. Feemster, of the State Department of Public Health, of seven human cases directly attributable to the virus from horses. The prevalence of encephalitis in horses in many parts of the country makes this of great importance. Notable also was the forthcoming new edition

of *Standard Methods for Milk Analysis*, which was discussed by Professor Breed at a special milk meeting on Friday.

Everyone knew that the meeting would be charged with intense interest over the National Health Conference held in Washington in July, at which the report and recommendations of the Interdepartmental Committee to coördinate health and welfare activities was made and discussed. A special session on the Public Health Aspects of Medical Care was held at which we were honored by the presence of Dr. Irvin Abell, President of the American Medical Association, who gave a paper explaining the standpoint of the medical profession. This meeting was an indication of the intense interest of our Association in the increase in public health consciousness which has been going on in professional bodies as well as among the public. At the meeting of the Governing Council this took the form of a resolution endorsing in general the recommendations made at the National Health Conference. The Association pledged itself to use all its resources and influence in aiding the governmental agencies in accomplishing these health objectives, and also instructed the Executive Board to appoint a committee of seven Fellows of the Association to coöperate during the coming year with the Interdepartmental Committee, the American Medical Association, the American Dental Association, the Conference of State and Provincial Health Officers, and other agencies, in putting these principles into effect. While we may discount some of the perfervid expressions of opinion on this action, there can be no doubt concerning its far-reaching importance.

On Thursday the Annual Banquet was held in the great Arena of the Auditorium, which on the floor and in the galleries can seat 15,000 people. At the Banquet there were more than 700 persons. Especial awards were announced, including the Health Conservation Contests Awards, following which a remarkable musical entertainment was given, featuring particularly the Indians from the Haskell Institute at Lawrence, Kans., and a Negro choir of some 80 members. One rarely hears more beautiful music than this choir produced.

We were particularly fortunate in having a large number of members and visitors from other countries, the Hawaiian Islands, Alaska, Canada, Puerto Rico, Mexico, and Cuba. Especially gratifying was the large number of our Canadian cousins, and among them we had the honor of entertaining Dr. A. Grant Fleming, Dean of the Faculty of Medicine of McGill University, Dr. John J. Heagerty, of the Department of Pensions and Public Health, Ottawa, and Dr. Adelarde Groulx, the Health Officer of Montreal, who has succeeded Dr. S. Boucher, who added so much to our meetings in the past. Our Canadian membership contributed not only to our pleasure but gave us a number of valuable scientific papers. From Cuba came General Domingo F. Ramos, formerly the Director of Health of that Island, and from Puerto Rico, Dr. Oscar Costa-Mandry. From Mexico we had Dr. L. Andreu Almazan, the Director of Health of that country, and seven of his staff. It was a great pleasure to welcome him, both officially and personally, to this, the first meeting of our Association which he has attended.

The hospitality of Kansas City is always notable. To Dr. Edwin H. Schorer, the genial Director of Health, without question the most efficient health officer Kansas City has ever had, everyone who attended the meeting is under a debt of gratitude. He was ubiquitous, always at the right spot at the right moment. Among the most delightful memories is the reception which he gave at his own residence.

At the last General Session we passed appropriate resolutions recognizing our reception by the officials of Kansas City and Kansas City in general, but we wish here once again to renew these expressions in public. The meeting was a great success from every standpoint, and we owe a debt of gratitude to our hosts.

EDWARD S. GODFREY, JR.

EDWARD Settle Godfrey, Jr., M.D., President-Elect, is a Western product. The second son of the late Brigadier-General Edward S. Godfrey, he was born, in 1878, at Fort Yates, N. D., then a small army post surrounded by the Standing Rock Indian Reservation. From the army post schools, in which his early education was begun, he finally reached Rutgers Preparatory School and the University of Virginia, from which he was graduated in medicine in 1900, interning for two years at the Germantown Hospital, Philadelphia.

His medical practice was begun at Bisbee, Ariz., a mining camp, site of the famous Copper Queen and Calumet and Arizona Mines. (Most of his friends, at one time or another, have been entertained by his stories of the mining camp days.) He practised later in Phoenix, Ariz. In 1908 he was appointed Superintendent of Public Health for the Territory of Arizona. In 1912 he was appointed school medical examiner for Phoenix public schools, and in 1914 City Health Officer.



Edward S. Godfrey, Jr., M.D.

In 1916 Dr. Godfrey went to the Illinois State Board of Health as epidemiologist, later becoming chief of the Bureau of Communicable Diseases. In 1917 he continued his Eastern migration, going to the New York State Department of Health, then being reorganized and expanded under the leadership of the late Dr. Hermann M. Biggs. Later he was director of the Division of Communicable Diseases for eleven years, becoming Assistant Commissioner for Local Health Administration in 1931 and, in 1936, following Dr. Parran's resignation to become Surgeon-General, Dr. Godfrey was appointed by Governor Lehman as State Commissioner of Health.

Dr. Godfrey has been a member of the Association since 1910, and a Fellow of the Association since 1931. The same inquiring attitude and "healthy skepticism" which made him an outstanding epidemiologist has contributed to the value of his service, over a long period, as an active member and Fellow in the Association. As was said by the retiring president when Dr. Godfrey was elected, it was most appropriate that he should have been elected in Missouri, since one of his best known characteristics was his insistence on being "shown."

Dr. Godfrey was one of the founders of the Epidemiology Section of the A.P.H.A. and of the American Epidemiological Society. He was chairman of the former in 1930 and president of the latter 1933-1934. For several years he was Clinical Professor of Epidemiology in the College of Physicians and Surgeons, Columbia University. He has written extensively on subjects relating to health, his best known writings being in the field of epidemiology. His continual seeking after the practical application of epidemiological knowledge is perhaps best exemplified by his paper on the epidemiology of diphtheria, which appeared in the *Journal* in March, 1932.

JOHN SHAW BILLINGS

Born April 12, 1838

FOR the second time this year we commemorate the 100th anniversary of the birth of a great medical man of our United States Army, this time John Shaw Billings, who was born April 12, 1838. Some 34 of his 75 years of life were passed in the active service of the U. S. Army Medical Corps. Much could be said of his military experience and services during the Civil War. Upon his appointment as First Lieutenant and Assistant Surgeon in 1862 he was put in charge of the Clifflurne General Hospital in Washington, which he found in a dreadful condition with "no drainage whatever, no sinks, no water within half a mile," and very inadequate facilities, so that his very first service led him to the study and practice of preventive medicine and hygiene in which he was interested throughout his life.

However, his fame rests on his accomplishments in Washington, where he was ordered in August, 1864. In 1879, Congress created a National Board of Health under the threat of an epidemic of yellow fever, and Dr. Billings was made Vice-President. In 1880, he was made President of the American Public Health Association. His acumen was shown about this time when he said, in speaking of yellow fever, "The belief that disease ever spontaneously originates from combinations of filth, heat, moisture, and the presence of unprotected persons, is an exercise of pure faith with which science has nothing to do at present. . . ." Dr. Billings was one of the first men in this country to lay stress on vital statistics, and he always took a keen interest in the censuses of the United States. His first extensive report on vital and medical statistics was in connection with the Census of 1880, and these reports were continued in 1890, 1900, and 1910.

Dr. Billings took a great interest in the Army Medical Museum, which is now the largest institution of its kind in America and one of the greatest in the world. In December, 1883, the Museum and the Library were consolidated, with Dr. Billings in charge. His reputation, however, has been largely founded on the Surgeon General's Library and its *Index Catalogue*.¹ At the time he took charge, the Library contained 2,253 volumes and the first printed catalogue in 1865 was a little pamphlet of 31 leaves. It has now grown to 50 ponderous royal octavo volumes of the *Index Catalogue*, which Osler called "Billings's float down to posterity." It is said of the *Index Catalogue* that it marks an epoch in the development and improvement of medical literature, particularly in the United States, but it is recognized all over the world as one of the great pieces of bibliography. Indeed, Professor William Bullock, in 1935, said, "Among

catalogues, the Surgeon General's is regarded by the authorities at the British Museum as the greatest ever achieved." In 1879, Dr. Billings established the *Index Medicus*, another "monumental piece of medical bibliography"—merged in 1927 with the *Quarterly Cumulative Index*. It is not strange that he is generally considered the greatest medical bibliographer in the history of medicine.

Dr. Billings is known not only as a great bibliophile and bibliographer but as a librarian. After his retirement from the Army in 1895, he was asked to take charge of the consolidated Astor and Lenox libraries of New York with the Tilden Trust. This is one of the notable libraries of the country and advanced greatly in its usefulness to the public under the administration of Dr. Billings. The present Director of the New York Public Library says of him, "that in the field of librarianship he holds as high a rank as he did in the fields of medicine, of engineering, of statistics."

Dr. Billings held a number of positions, among which was Director of the Hygienic Laboratory of the University of Pennsylvania. He planned the original buildings of the Hospital of Johns Hopkins, where he is regarded as one of the "founding fathers of both the Hospital and the Medical School." Dr. Billings's papers on Medical Education and History of Medicine are especially noteworthy. He gave a course of lectures on the latter subject at Johns Hopkins in the autumn of 1877.

NOTE: The Johns Hopkins Medical Society and the Johns Hopkins Medical History Club held a joint meeting April 12, 1938, to commemorate the 100th anniversary of the birth of Dr. Billings. The Institute of the History of Medicine has issued a Memorial Number, many of the articles of which are found also in the *Bulletin of the Johns Hopkins Hospital* for April, 1938. These are illustrated with many photographs of Dr. Billings.

REFERENCE

1. A Great Medical Library, *A.J.P.H.*, Sept., 1936, p. 930.

RAW OR PASTEURIZED MILK?

IN this country everyone who has studied the question even a little is sure of the nutritive value of milk and of its value as a supplementary diet, but even so, strong supporting evidence is welcome.

In England factors led to the formation of a Milk Nutrition Committee.¹ Just before this the Milk-in-Schools Scheme had been set up and afforded an opportunity for a scientific study on its effects on the growth and health of the children participating. It is true that several other such studies had been reported from 1928 to 1930. Research was begun in February, 1935, and ran through the entire school year in each of five areas, covering in all 8,435 children divided into four groups: 2,000 for control, 2,000 on $\frac{1}{3}$ pint of pasteurized milk, 2,000 on $\frac{2}{3}$ pint of pasteurized milk, and 2,000 on $\frac{2}{3}$ pint of raw milk, as a supplementary diet. The study ended in July, 1936. The children were fed a diet to which milk was compared with biscuit, also as a supplementary diet, and were studied as to increase in height and weight after having been assessed clinically as to their general condition. They were also divided as to sex and into three age groups. "Of the 6 comparisons of the average gains in height of these groups over the groups with biscuits, 2 favour raw milk (boys 5-7, girls 11-14), and 4 favour pasteurised (boys 8-10 and 11-14, girls 5-7 and 8-10); of the corresponding comparisons of weight, 4 favour raw milk (boys 5-7 and 8-10, girls 8-10 and 11-14) and 2 favour pasteurised (boys 11-14, girls 5-7).

The only age group in which the two sexes give consistent differences is 8-10 years, in which the increases in height were less on raw than on pasteurised milk and the increases in weight were greater on raw milk."

It is pointed out that in this study the general quantitative response to the milk supplement was not so great as was reported in previous experiments, probably because the amount of milk was smaller and possibly also because of improvement in the average diet of the working class homes during the past 8 years or so. The condition of the study did not allow of any exercise over the control of the home diet consumed by the children or to evaluate it qualitatively or quantitatively.

The general results are in favor of milk as a supplement, even in the smaller amounts. "Comparisons of the growth increments in three different age groups, 5-7 years, 8-10 years, and 11-14 years, show that at each age children with $\frac{1}{3}$ pint of milk gained more in weight than those with biscuits, and probably—but rather less consistently—gained more in height."

Most interesting is the fact that examination of the groups clinically assessed as: "(1) good or excellent, (2) satisfactory or normal, (3) poor or bad, leads to the conclusion that, on the whole, children of each clinical grade with milk supplements showed higher rates of growth than children in the corresponding clinical grades with the biscuit supplement."

As we have said, there does not seem to be any room for argument as to the value of good milk in the diet. There are still those who question the comparative value of pasteurized milk as against raw, so that the following conclusion is of especial interest. "Whether comparisons be made of the increments of growth in the total of children or in sub-division by age, area, and clinical assessment, no consistent difference is apparent in these increments between children whose supplement was $\frac{2}{3}$ pint of pasteurized milk and the children whose supplement was $\frac{2}{3}$ pint of raw milk." An experiment done on such a large scale and under the conditions pertaining in this one should settle the question of the value of raw as compared with pasteurized milk in feeding children, especially as it confirmed the laboratory tests carried out by the same institution.¹

The whole report is full of interesting questions to those in the field of nutrition generally or to school children and their physical welfare. It must be read and studied to be fully appreciated.

REFERENCE

1. *The Effect of Commercial Pasteurisation on the Nutritive Value of Milk, as Determined by Laboratory Experiment.* National Institute for Research in Dairying, Shinfield, Reading, England, Part I. 1937.

Ohio State, North Carolina State, and Canadian National stamp the address at the top of the cover page. Indiana State uses a sticker at top of the cover page.

Michigan State, and Florida State stencil the address at the foot of the last page. New Haven uses a sticker in a 2 inch high space at the foot of the last page.

Georgia State stencils in a 2 inch high space at the top of the last page.

None of the above is enclosed or fastened in any fashion.

Get Them into Courses—We have not done so much in getting groups to attend courses of lectures, single talks, or discussions.

A paid course, at moderate prices, with more or less of reading, study, and consultation as "accessories," would be one step toward securing a much needed nucleus of informed local leaders. For several years in Massachusetts, the university extension courses of the State Department of Education, Boston, Mass., has given a series of lectures in non-technical language called "Keeping Mentally Fit." A fee is charged for auditors; a larger fee for credit students. The nature of the courses and the groups likely to be interested, are carefully described in the announcement folder.

For Prospective Fathers—Reports Maternity Center Association, 1 E. 57th St., New York, N. Y.:

Last year the Maternity Center Association announced a series of classes for prospective fathers to teach them the physiology of pregnancy; how to choose good medical, hospital, and nursing care for their wives; how to help their wives keep fit; how to care for the baby; and how to help to fit the baby into the home without needless confusion.

The association was besieged by men eager to take the course. After they had completed the 5 lessons and several practice periods in bathing, dressing, watering,

bubbling, and diapering the demonstration doll, they all agreed that the course had helped them to approach paternity with a feeling of preparedness.

The association has received a number of requests for the outline of the material presented to this group of pioneer students in expectant paternity. This syllabus has been prepared in response to these requests. Suggestions for its improvement will be greatly appreciated.

In response the association offers a "Syllabus: Classes for Prospective Fathers." 15 cents. This includes the announcement which introduced the idea to newspaper readers. Outlines for 4 lessons are given.

"A Talk for Prospective Fathers" is based on the outline for the first of the 4 lessons. 10 cents.

The following is the suggested substance of a talk by a physician to men whose wives are about to become mothers. It gives in outline form certain information about childbirth and suggests topics for discussion. The form of the talk may have to be varied according to the size and background of the group. But the aim is to describe briefly the process of generation, including anatomy and physiology, the signs and symptoms of pregnancy, the course of labor, the occurrence of various common disturbances and diseases.

There are many general facts which should be known to the husband so that he may be able to comprehend more effectively his responsibilities in this all-important function. This knowledge should contribute to the happiness and welfare of both partners. In all of this, the necessity for early and adequate medical care is to be stressed and the father urged to participate in providing good care for his wife.

The speaker may modify or add to the material in this outline as seems best in his judgment. Prospective fathers will better understand the process of generation and birth if the descriptions of the organs, fertilization, the course of labor, and other features are illustrated with simple blackboard drawings, or with the aid of models, charts, etc. Simplicity should prevail in presenting the subject; there is no need for elaboration of details, and discussion of treatment should be avoided.

The talk seems to emphasize that the course is a rather stiff one. It would

seem wise for Maternity Center Association to submit more suggestions as to the methods of handling a group of fathers.

A Different Report—Under the quoted headings appeared the paragraphs below, and others.

"Well, *What Have Ye Done?*"—"Well, what have ye done in the two years ye have been galavantin' around this country?" Mrs. Smith asked when I told her the Health Department had a birthday," remarked Miss Hassels, the nurse, at the regular staff meeting in July. . . .

"That's a good question, what have we done?" repeated the director, leaning back in his swivel and looking around at his staff. There were Dr. P. R. Lynch, the dentist; E. C. Knight, Sanitary Engineer; Miss Hilda Cabaniss, Osceola County Nurse; Margaret Wilson, Clerk in Reed City office; Miss Anna Hassels, Mecosta County Nurse; and Velma Allen, Big Rapids Clerk. . . .

A Matter of Life and Death—"I noticed that birth registrations are increasing so far this year," remarked Mrs. Allen. "Last year the birth rate dropped considerably. Death certificates coming in from local registrars show a decline, even as compared with the number recorded in 1937, which was lower than in 1936."

"Yes, I noticed that, too," said the director. "In the first 6 months of this year, there were 31 more births than in the same period of 1937 and there were 36 less deaths."

"What does this mean? Figures do not lie. By inspecting them at frequent intervals we can determine whether we have made progress or whether we have merely marked time. The recording of births and deaths makes up the balance sheet of our population. From these records the health officer may draw knowledge to be applied in future public health programs."

Mary Runs Wild—"Here is a letter from a doctor up in Marion who complains that Mary Smith is running wild with untreated gonorrhea. The girl is only 16," Dr. Igloe added.

"We have another case in a 14 year old girl. She is also pregnant," remarked Miss Cabaniss.

"It seems that venereal disease is a disease of youth—and that is what the records really show," remarked the Director, "of 22 cases of gonorrhea recently reported, 17 were under 30 years. Of 9 cases of syphilis reported, 6 were under 30 years of age."

The above are selected from "After Two Years: The Story of the Mecosta-Osceola Health Department—1936-38." The Central Office for the two counties is at Big Rapids, Mich. Although the report does not indicate the state. Director M. C. Igloe, M.D., has a dentist and sanitary inspector, and a clerk and nurse in each county.

"Contents" has two parts. "The Story" in 10 chapters is text; "The Facts" are 10 statistical and factual tables. Mimeographed on letter size paper, heavy cover, spiral binding, yellow paper for the statistics.

Another year it is hoped that chapters 9 and 10 of "The Facts" will be made chapters 1 and 2 where they will not be lost to those not interested in the statistics. These chapters are 3 pages of "Services Rendered," and a page organization diagram.

Don't Unbalance the Diet—An editorial, "Fifty-Fifty," in *Editor and Publisher* (Oct. 22, 1938) discusses a recent prophecy that soon the newspaper will be half text and half pictures.

A picture may be worth 10,000 words, but not every picture is. Few in fact are. A picture, or a series of pictures, can tell some stories completely; they can often complement a word story which needs visualization for completeness. Many stories would be the better for illustration—but a picture alone cannot convey to readers the balanced diet of information necessary for the operation of a democracy. . . .

We have never found an interesting story hard to read because it was set in a gray-black column of type. We don't object to length when length means information—and the popularity of the mastodon novels like *Gone With the Wind* indicates no public aversion to mere length or solid gray pages.

If newspaper words paint pictures, as they should, there'll be no need for making the photographer do all the work. Pictures have their place—one of increasing importance—but it is not at the head of the parade. . . .

Says Dr. Iago Galdston, sender of the clipping:

It is worth noting that we see with the brain and not alone with our eyes. The visual message should therefore be for the brain through the eye. Too many stop at the eye level! Again when thought is given to the message for the brain, text is frequently found to be the better vehicle.

Need there be a moral? At least we guard against any method or technic of presentation running away with our health education. And what we have to say to secure the result we are after calls for first consideration. Then we select and balance the forms of presentation.

A Gay Health Play for Adults—Written for a "father-mother-daughter" banquet it includes no fairies, and its solemnity is mockery. Built around the alleged health habits of four leading citizens, in use elsewhere the idea would need adaptation to local people.

It is "The Health Court," by M. C. Pearson. *Womans Press*, 600 Lexington Ave., New York, N. Y., Oct., 1938. 20 cents. A sample:

The Bailiff places Mrs. Jones before the Judge:

Prisoner Jones is accused of sleeping less than 9 hours per night. Hither and yon she goes, to board meetings, to clubs, to committee meetings, keeping late hours and arising early each morning in spite of it. Sometimes she is known to go to bed on time but to lie awake and think! (He reads slowly and impressively.)

Judge (sadly, shaking his head): Lie awake and think! Does the prisoner not know that 9 hours' sleep are absolutely essential if she wants to be president of the board and a member of this and a member of that? Prisoner, what have you to say for yourself?

(The prisoner answers, but no matter what she says, the play goes on as written.)

Judge (turning to the Jury): Gentlemen of the Jury?

Jury (rising): Guilty, Your Honor. (They sit.)

Judge: Prisoner Jones, I sentence you to one week at home without any outside cares or diversions, responsibilities or excitements, committee meetings or conferences. You shall have a 2 hour nap every afternoon and abso-

lutely 9 hours' sleep every night thereafter. Next!

(Prisoner Jones goes back to her seat on the stage as the next prisoner comes up.)

"Preventive" Or Not "Preventive"?—Here is an inquiry which comes from E. Louise Williams, Librarian, State Board of Health, Jackson, Miss.:

I would like to have your opinion with regard to the use of the word "preventive" in connection with the following:

preventive health services
preventive health examinations.

"Preventive" appears to modify the word "health" in these expressions, and in a literal sense seems to be inaccurate. To the laity who read such expressions, there is likelihood of only the first two-thirds of the thought registering, and from a "selling" standpoint the psychology seems poor. I have stumbled across these expressions several times recently and before I consider their adoption, would like to have the benefit of your opinion.

What Would You Have Said?—Will someone tell me what advice and information might well have been sent in reply to the letter quoted below?

Your address has been referred to me as a possible source of aid with publicity. We are about to put on a campaign and I feel this small city that has had our organization for 25 years needs some rather good publicity. They have had the same work for so many years.

MAGAZINE ARTICLES

"Hostess." *American Magazine*, 250 Park Ave., New York, N. Y. Aug., 1938. 25 cents. One phase of the problem of caring for some of the needs of those who reach hospitals, clinics, etc., as patients or visitors. This is a self-supporting "Hospitality Shop."

"The Fight on 'Polio,'" by Dr. W. R. Ramsey. *Farmer's Wife Magazine*, St. Paul, Minn. Sept., 1938. 10 cents. Some late developments.

"X Ray marks the spot," by H. Ripperger. *Good Housekeeping*, 57th and 8th Ave., New York, N. Y. Oct.,

1938. 25 cents. "The case against tb." well stated. Also: "Reduce and Like It," by K. Fisher; "Avoid Pitfalls in the Reducing Game," by Dr. W. H. Eddy. "Treatment of obesity is the province of the physician." As to the menus: "They may be of service to you and your physician."

"Animal Experimentation." Is it essential to the progress of medicine? *Life*, 330 E. 22d St., Chicago, Ill. Oct. 24, 1938. 10 cents.

"Movie of the Week: The Citadel." *Life*. Nov., 1938.

"A Medical Student Becomes a Doctor: The Life of an Intern," by Dr. Morris Fishbein. 4 picture pages. *Look*, Des Moines, Ia. Oct. 25, 1938. 10 cents.

"Population Problems," by H. Ward. *New Republic*, 40 E. 49th St., New York, N. Y. Aug. 17, 1938. 15 cents. "The net impression . . . is that if we can learn to provide adequately for our present . . . people, we will not need to worry about the bogey of excess numbers in the future."

"The Falling Birth-Rate." *Social Welfare*, 37 Bloor St., West, Toronto, 5, Ontario. Sept., 1938. 25 cents. "The falling birth-rate need not worry us. It is exactly what any sane person would expect."

"By Six-to-One in California," by P. K. Brown, M.D. *Survey Graphic*, 112 E. 19th St., New York, N. Y. Nov., 1938. 30 cents. State supreme court action on group medicine. Also: "We Can Banish Gonorrhea," by J. B. Clark, M.D. "The battle ahead is going to be a long and hard one."

NEW

Health Education In Kansas, Kansas Tb. and Health Assn., Topeka..

Your Health, Health Dept., Newton, Mass., now printed. An ornamented heading on the first of the 4 pages, a tinted background, different for each

issue. Will be mailed to health officers upon request.

Here's Health! weekly mimeographed bulletin of State Board of Health, Dover, Del., comes with a metal staple to be removed before reading—not so good for appearance or for the patience of receiver. Probably in the state at least, it would carry nicely without fastener. Outside of the state use a sticker, or a bit of transparent Scotch tape? Then run in addressing machine so that the fold is at the top. See "How the House Organ Is Addressed" elsewhere in this issue.

Nassau Health, Nassau County Dept. of Health, Mineola, N. Y. Mimeographed, 4 letter-size pages.

Channels, Social Work Publicity Council, 130 E. 22d St., New York, N. Y., is the new printed periodical, successor to the mimeographed *News Bulletin*. It is an effective combination of color, paper, and typography, developed largely through the advisory services of Curtis E. Lakeman. Mr. Lakeman was long known in connection with health agencies—New York State and New York City Health Departments, and the formative years of the American Society for the Control of Cancer—in which he had much to do with health education or its general supervision. In the first issue Mary Swain Routzahn, under "But Not One Cent for Publicity," reviews current criticism of governmental publicity, and raises questions, some of which have a bearing on city and state health department health education, particularly that which calls attention to the activities and services of the departments.

WANTED

Material for a talk to high school groups on "Why a County Health Department" will be welcomed by S. S. Burner, M.D., District Health Unit, Owensville, Mo.

BOOKS AND REPORTS

Public Health and Medical Licensure in the State of Mississippi, 1798-1937—By *Felix J. Underwood, M.D., and R. N. Whitfield, M.D. Jackson, Miss.: State Board of Health, 1938. 175 pp.*

The book deals with the development of public health work in Mississippi from 1799, when the Legislative Assembly of the Territory of Mississippi passed an act "to provide as far as possible against the fatal calamities of contagious diseases," to 1937. The first law requiring a medical license in Mississippi was approved February 12, 1819.

The history of public health in Mississippi may be divided into three periods. The first begins with the formation of the Mississippi Territory in 1798 and extends to the organization of the Mississippi State Board of Health in 1877. During that period a health department for the City of Natchez was established by law in 1818, in which year Mississippi became a state. It provided for sewage disposal; regulation of the sale of damaged or unsafe commodities; a report by the attending physician giving the age of deceased persons and the cause of death; and the appointment of a skillful physician as health officer. Following that, other state laws were enacted referable to the sale of unwholesome food; the establishing of a smallpox vaccine depot in Jackson in 1846; the empowering of towns to pass health regulations; and legislation creating boards of health in Hancock, Harrison, and Jackson Counties.

The second period extends from 1877 to 1910, in which the significant de-

velopment was the organization of a State Board of Health in 1877. That body was organized in such a way as to become a part of the Mississippi State Medical Association. The same plan of organization exists today except that a dentist has been added.

The third period extends from 1910 to 1937. It began in 1910 with the appointment of Dr. W. S. Leathers as the Director of Public Health for the Mississippi State Board of Health in charge of organization and administration of public health activities. As a result of the stimulation of interest on the part of the public by the workers connected with the hookworm campaign conducted by the State Board of Health in coöperation with the Rockefeller Sanitary Commission, the first full-time county health department was organized in 1915. Other important developments were the organization of a bacteriological laboratory and the office of State Sanitary Inspector which later became the Division of Sanitary Engineering. A Bureau of Vital statistics was established in 1912 with the result that the state was admitted to the U. S. Death Registration Area in 1919 and to the U. S. Birth Registration Area in 1921. Biological products were purchased and distributed to physicians and health officers. Morbidity reporting was instituted in 1913. In 1917 Dr. Leathers was made Executive Officer of the Mississippi State Board of Health and was succeeded in 1924 by Dr. Felix J. Underwood.

Coöperation with other health agencies has been an important factor in the development of the organization. The Rockefeller Sanitary Commission

and the International Health Division of the Rockefeller Foundation, the U. S. Public Health Service, the American Red Cross, the Commonwealth Fund, and the Rosenwald Fund have all aided materially since 1910.

Important research and field investigations relative to yellow fever, pellagra, malaria, typhoid fever, hookworm, and epidemic encephalitis have been conducted which have contributed to our knowledge of these diseases and have aided in their control.

The present organization includes the essential administrative units of a modern health department serving a southern state. It has kept pace with the advances in the field of preventive medicine and has developed its local full-time service to the point where in 1937 there were 33 counties with full-time public health departments serving 50 per cent of the population and covering 40 per cent of the state.

The book contains excerpts from original acts of the Legislature and addresses of members of the medical profession relative to public health matters. Included are charts, maps, and biographical facts relating to those who have been instrumental in the development of public health work in Mississippi since 1877.

ALVIN E. KELLER

The Hospital Head Nurse—By Mary Marvin Wayland, A.M., R.N. New York: Macmillan, 1938. 388 pp. Price, \$3.50.

Those who are charged with the responsibility for hospital management have a true realization of the all important part played by the head nurse. The author defines the purpose of this book as a desire to help head nurses to a better understanding of their responsibilities to the hospital and to the school of nursing. It meets the great need of those who are particularly concerned with the efficient conduct of

the executive aspects of ward nursing and the training of nursing personnel.

Twenty-two chapters and appendices are devoted to pointing out the varied duties and responsibilities of head nurses. Seven of these, in very readable form, are devoted to a presentation of the nurse's responsibility as hostess, nursing expert, practical sanitarian, housekeeper, steward, economist, a junior executive, and as a teacher of both patient and staff. The part she should play in the school of nursing program is also thoroughly defined.

The material is authentic, well outlined, with good summaries, and rich in biographical references.

There is a marked relation between the efficiency of the head nurse and the good care of the patient, and this book can be of invaluable aid in the training for more efficient management, and in the furtherance of nursing education.

CHARLES F. WILINSKI

Science in Our Lives—By Benjamin C. Gruenberg and Samuel P. Unzicker. Yonkers, N. Y.: World Book Co., 1938. 750 pp. Price, \$1.76.

During the last twenty years, there has been a great deal of discussion in secondary school circles as to the need of organization of courses in "general science." The implication is that it is possible to give high school students a single course that will develop for them a concept of the most important phases in such sciences as chemistry, physics, biology, and hygiene. This is in direct contrast to the older procedure of giving separate courses in physics and in chemistry, and, in later years, in biology. The high schools in a considerable number of communities now offer such a combined course.

This text is an effort to provide reading material, problems, and activities which shall "offer opportunity for practical training in scientific thinking in everyday situations." These activi-

ties include experiments, demonstrations, and investigation. An effort is made to appeal to the varying interests of the young people concerned.

The text is divided into two parts: Part I including four units on air, water, fire, and earth; and Part II having four units, the first of which "Controlling the World" deals with work, machines and tools, power and motors, the second dealing with electricity, the third with the living machine, and factors like foods, environment, reproduction, heredity, and mental attitudes which affect the conditions of that machine, and fourth a discussion of the special senses.

Each chapter has at its end a summary of the chapter, a group of questions on the material covered by the chapter, and a group of problems for the class to work on in an effort to bring concentrated thought upon the more important factors discussed.

CHARLES H. KEENE

Posture and Exercise for Young Children—By Dr. John Gibbens. London: National Association of Maternity and Child Welfare Centers and for the Prevention of Infant Mortality (Carnegie House, 117 Piccadilly, W. 1), 1938. 23 pp. Price, \$.50.

This helpful and attractive pamphlet presents a clear picture of what may be accomplished in developing good posture in young children. Following a general description of what good posture means and its effects upon health, there is given a series of exercises as a part of play designed to bring all the skeletal muscles into activity. These exercises are illustrated with charming silhouettes of young children in action. The author warns that "formal exercises and fixed gymnastics are bad for young children, for they do away with wit and humour and imagination, without which the world would be a poor place." The pam-

phlet is well written and should prove helpful to those engaged in infant and preschool work.

RICHARD A. BOLT

Health, Hygiene and Hokey—By W. W. Bauer, M.D. New York: Bobbs-Merrill, 1938. 322 pp. Price, \$2.50.

This book, written for the layman, is different. The author calls attention to the fact that so much interest has been aroused in health that there is a vast amount of both information and misinformation (entirely too much of the latter) peddled by all sorts and kinds of people. It is important to be able to distinguish between authentic sources and those that are not, therefore, instead of naming names, as he expresses it, he devotes his efforts to general principles. He says, "The best safeguard against exploitation is a knowledge of principles. Individual exploiters come and go; nostrums rise, flourish, and vanish; quackery is different every day and yet, fundamentally, the same. A person who understands the characteristics of charlatanism will not be fooled by the individual exploiter." The general argument is summed up in his last chapter, "Common Sense, Preferred," and his last words warn the health seeker that his best security will be found in "Common Sense, Preferred, and Skepticism, Unlimited."

The author has a gift for striking titles, such as "Swivel-Chair Hygiene," "Dispelling Dietary Dilemmas," "A Fake for Every Ache," "Soft Soap and Skin Games," etc. We particularly recommend Chapter XIV "Who Pays the Piper." In addition to formulating striking titles, he also has a humorously impressive way of putting facts. For example, in speaking of mascara, he says, "Making up the eyelashes is a safe procedure if only mascara is employed. This formerly put the lady at

a disadvantage, because tears played havoc with it. Now all that is changed with the advent of waterproof mascara, which allows a lady to weep and still be lovely." The ordinary materials of everyday make-up are called "war paint." "... hope springs eternal in the baldest heads, and the shining pink cranium is always good for a rub of something or other which raises hope if not hair."

There is a long appendix called "They're Telling You!!" in which are given the principal governmental sources from which one may get correct information on health, also the voluntary societies, beginning, of course with the A.P.H.A.—"the basic fundamental organization of technical workers in public health, including doctors, nurses, laboratory and research technicians, engineers, sanitary officers, statisticians, and health educators." The author does not believe that a book list should be given in a work of this kind since books come and go and such lists should be kept up-to-date to be of real value. However, he gives 22 books now on the market which may be consulted, and 5 health magazines.

The book is interestingly written and will hold the attention of readers. It goes well with "The Traffic in Health" and "Poisons, Potions, Profits." It is accurate and can be recommended without any reservation. We wish for it a wide circulation.

MAZÏCK P. RAVENEL

In the Name of Common Sense: Worry and Its Control—By Matthew N. Chappell. *New York: Macmillan, 1938.* 192 pp. Price, \$1.75.

This book was written "for and about normal people—people who can lay the foundations of their own emotional discomforts, nurture them to inconvenient intensity, and learn with ease to control them." The author believes that worry, which is so prevalent

an activity in this era of great insecurity, is an expensive luxury which no individual can afford, and the book is offered as a guide for the intelligent layman who has inadvertently become an accomplished worrier and who wishes to eliminate this drain on his energies.

Worry, or the undue preoccupation with painful thoughts, is regarded as a psychological habit which has been learned and gradually developed through persistent practice. The really proficient worrier, as a result of his emotionally charged thinking, gradually acquires a whole series of alarming symptoms, which may include anxiety and fear, fatigue, indigestion, decrease in sexual interest, constipation, insomnia, a variety of pains and aches, excessive irritability, and marital unhappiness. A chapter on each of these subjects is offered "to supply 'insight,' to explain the acquisition of discomforts; their real significance, if any; and how they may be controlled."

The book is based on extensive experience, much of which has been in collaboration with physicians, in the successful adjustment of patients through psychological re-training. It is written in a vigorous and humorous style, which will hold the reader's interest, and for the group to which it is addressed, it should be of great aid in understanding and overcoming their difficulties.

CLARA BASSETT

Industrial Hygiene—A Handbook of Hygiene and Toxicology for Engineers and Plant Managers—By Lawrence B. Chenoweth, M.D., and Willard Machle, M.D., with Foreword by Herman Schneider, Sc.D., LL.D. *New York: F. S. Crofts & Co., 1938.* 235 pp. Price, \$2.00.

This is essentially a brief general coverage, by a community and school hygienist and an industrial toxicologist, both of Cincinnati. The first 7 chapters (by Dr. Chenoweth) comprise a

historical introduction (7 pp.); workmen's compensation (7 pp.); industrial accidents (14 pp.); fatigue (6 pp.); physical factors in industrial hygiene (11 pp.); health service in industry (10 pp.)—with somewhat disproportionate space given to *locomotor ataxia*; and first-aid treatment of injuries (27 pp. plus appendix of 20 pp.)—well rendered, with many illustrations. Rather too much space is given to snake bite and far too little to tuberculosis for industrial hygiene purposes.

The succeeding 8 chapters (119 pp.) by Dr. Machle are chiefly a laboratory approach—brief, well rendered, and fairly comprehensive—on occupational intoxication; chemical burns; oxygen deficiency and asphyxia; dust diseases; respirators, etc.; occupational affections of the skin; industrial neuroses and malingering; and miscellaneous occupational affections. The author shows an original and interesting approach to the poison question. Some of the definitions within which he confines himself seem too restricted to the reviewer.

Dangerous trades and callings are, in general, omitted. The great majority of the 104 illustrations pertain to first-aid procedures. An adequate Index accompanies and the book is well printed and bound.

No bibliography is included, but a few references are made. Necessarily many omissions occur in a limited volume devoted to such a broad subject.

There are several comparable and more extensive works in this same field with which the engineer and plant manager should also stock his library.

EMERY R. HAYHURST

A Historical Chronology of Tuberculosis—By Richard M. Burke, M.D. Springfield, Ill.: Thomas, 1938. 84 pp. Price, \$1.50.

This book is divided into four periods, the Ancient (5000 B.C.—1600

A.D.), the Pre-Modern (1600–1800), the Modern, Part One (1800–1881), and the Modern, Part Two (1882–19—). The chronology is useful and as far as the reviewer has been able to check it, correct. One is surprised to find such things mentioned as the invention of gunpowder in 1330, the voyage of Magellan in 1519, the invention of the power loom in 1785, etc., and one finds it hard to see what these have to do with the history of tuberculosis. The author explains that he has included certain happenings which formed a part of the background upon which the pattern of tuberculosis has unfolded, but in spite of this explanation, we cannot see that these events are pertinent to the subject. Certain medical events, like the Black Death in 1348, and the discovery of insulin in 1921, also appear to have no bearing on tuberculosis.

We wish that the author had been a little more exact concerning the London Congress on Tuberculosis in 1901, in which Koch claimed that bovine tuberculosis was not important as a danger to man. He was combated at once at the same Congress with facts which were amplified in 1902, when experiments under way in 1901 were complete.

Altogether, the book is a useful and interesting one. It ends with a chart giving a graphic outline of the development of our knowledge of tuberculosis. The printing and make-up are excellent, and the book can be recommended to all interested in this disease. There is a very good index both of names and subjects.

MAZÏCK P. RAVENEL

An Introduction to Medical Statistics—By Hilda M. Woods and William T. Russell. London: P. S. King & Son, Ltd., 1936. 125 pp. Price, \$2.75.

This book was written to meet the needs of young medical students in the

London School of Hygiene and Tropical Medicine. Although small enough to be placed within the pocket, it touches upon the essentials of vital statistics. What is meant by statistical analysis is well expressed and in few words.

Chapter headings include Vital Statistics, Tabulation of Data, Construction of Charts and Graphs, Population, Standardised Death-Rate, Averages, Measures of Dispersion, Correlation, Coefficient of Regression, Life Tables and Sampling.

Pit-falls into which the student often falls are illustrated. Numerous tables

and graphs add to the value of the book.

Statistics is a confusing subject to most medical students. They have difficulty in clarifying within their minds the meaning of statistical constants, such as averages, measures of dispersion, correlation, etc. It is to be regretted, therefore, that this book unnecessarily adds to the confusion when it makes general use of an arbitrary origin in its illustrative computations.

The book can be read from cover to cover in a few hours and the subject of medical statistics will be found far from dull.

J. N. BAKER

BOOKS RECEIVED

THE HISTORY OF BACTERIOLOGY. By William Bulloch. New York: Oxford, 1938. 422 pp. Price, \$3.75.

FOODS. PRODUCTION, MARKETING, CONSUMPTION. By Jean J. Stewart. New York: Prentice-Hall, 1938. 737 pp. Price, \$3.25.

A GUIDE TO HUMAN PARASITOLOGY FOR MEDICAL PRACTITIONERS. By D. B. Blacklock and T. Southwell. Baltimore: Wood, 1938. 259 pp. Price, \$4.00.

MANUAL OF VETERINARY BACTERIOLOGY. By Raymond A. Kelsner. 3d ed. Baltimore: Williams & Wilkins, 1938. 640 pp. Price, \$6.00.

SANITATION OF THE DRINKING GLASS. Part One, Method and Procedures, By Jack G. Baker. Part Two, Practical Control, By Raymond V. Stone. Los Angeles: National Association of Sanitarians, 1938. 60 pp. Price, \$25.

HEALTH INSURANCE WITH MEDICAL CARE. The British Experience. By Douglass W. Orr and Jean Walker Orr. New York: Macmillan, 1938. 271 pp. Price, \$2.50.

SLEEP! THE SECRET OF GREATER POWER AND ACHIEVEMENT. By Ray Giles. Indianapolis: Bobbs-Merrill, 1938. 290 pp. Price, \$1.75.

EDUCATIONAL BROADCASTING, 1937. Edited by C. S. Marsh. Chicago: University of Chicago Press, 1938. 387 pp. Price, \$3.00.

TEACHABLE MOMENTS. A New Approach to Health. By Jay B. Nash. New York: Barnes, 1938. 243 pp. Price, \$1.50.

OUR COMMON AILMENT. CONSTIPATION: ITS CAUSE AND CURE. By Harold Aaron. New York: Dodge, 1938. 192 pp. Price, \$1.50.

CARBON MONOXIDE ASPHYXIA. By Cecil K. Drinker. New York: Oxford, 1938. 276 pp. Price, \$4.50.

BIOLOGY AND PATHOLOGY OF THE TOOTH AND ITS SUPPORTING MECHANISM. By Bernhard Gottlieb, Balint Orban and Moses Diamond. New York: Macmillan, 1938. 195 pp. Price, \$5.00.

THE HEALTH PROGRAM IN SMALL ASSOCIATIONS. By Edith M. Gates. New York: Womans Press, 1936. 57 pp. Price, \$.65.

BIBLIOGRAPHY AND ABSTRACTS ON THE CHLORAMINE TREATMENT OF WATER. Collected and Prepared by Project 465-97-3-35 Research in Selected Problems in Sewage Treatment. New York: Department of Sanitation, 1937. 225 pp.

BOSTON COLLEGE SCHOOL OF SOCIAL WORK STUDIES. The Professional Secret in Social Work. By Walter McGuinn, S.J. Boston: Boston College School of Social Work, 1938. 34 pp.

MATERNITY CARE IN A RURAL COMMUNITY. Pike County, Miss., 1931-1936. By Maxwell E. Lapham. New York: Commonwealth Fund, 1938. 65 pp. Price, \$2.25.

SPRING FLOODS AND TORNADOES, 1936. Official Report of Relief Operations. Washington: American National Red Cross, 1938. 173 pp.

ESTUARY OF THE RIVER MERSEY. Effect of the Discharge of Sewage on the Conservancy of the River. Department of Scientific and Industrial Research. (Water Pollution Research Technical Paper No. 7.) London: His Majesty's Stationery Office, 1938. 337 pp. Price, \$8.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

On Sundry Matters—The further preventive medicine is kept from curative, the better the jobs will be done. The time for clinics detached from hospitals is past; clinics in health centers should be discouraged. Rheumatic fever stands next to tuberculosis, pneumonia, and syphilis among the communicable diseases and is the forgotten health problem. Domiciliary medical and nursing care must be developed under non-political auspices. These are random gleanings from a long and provocative paper.

CORWIN, E. H. L. Reorientation in the Public Health and Hospital Organization Patterns of Our Communal Life. *New York State J. Med.* 38, 20:1320 (Oct. 15), 1938.

Standards of Driving Fitness—In last month's Annotated Bibliography, we learned that with not more than 0.5 parts per 1,000 of alcohol in the blood, one could drive with no more chance of accident than if he had not had a drink. Now we are told that 2 oz. of whiskey or 1 to 1½ qts. of beer, taken on an empty stomach, will give a blood alcohol concentration not in excess of that amount. After a meal double quantities may be taken within the same limits of effect.

HAGGARD, H. W., *et al.* Quantitative Differences in the Effect of Alcoholic Beverages. *New Eng. J. Med.* 219, 13:466 (Sept. 29), 1938.

Rheumatic Fever Signs—"Growing pains" are not related to rheumatic fever and do not provoke rheumatic carditis. They are usually associated with colds, slight orthopedic deformity, and other conditions that can be discovered and treated by ordinary

methods. If this British doctor's views hold water on this side of the Atlantic, some health educators hereabouts had better look to their teaching material.

HAWKSLEY, J. C. The Incidence and Significance of "Growing Pains" in Children and Adolescents. *J. Roy. San. Inst.* 1, 13:798 (Oct.), 1938.

Ten Years' Improvement in Tuberculosis Incidence—Percentages of certain Philadelphia high school students reacting to tuberculin declined from 80 in 1927 to 64 in 1937. In girls the decline was greater than in boys. There was no decline in incidence of infection among Negro students. Also, the incidence among Philadelphia high school students remains considerably higher than in many other cities.

HETHERINGTON, H. W., *et al.* The Incidence and Control of Tuberculosis in High School Children. *Am. Rev. Tuberc.* 38, 4:406 (Oct.), 1938.

Good News (Sanitary)—In 1930, for the first time in United States history, the population living in communities having sewage treatment caught up with the increase in urban population. Since then, the sewage of 6 million additional people has been disposed of by some method better than dilution. During this time the improvement has been qualitative as well as quantitative, for there has been a distinct advance in every phase of the sewage treatment art.

HYDE, C. G. A Decade of Sewage Treatment: 1928-1938. *Munic. San.* 9, 10:480 (Oct.), 1938.

Urban Birth Rates—Country people who move to the city before

marriage have no more children than city folks. This is true of colored and white people.

KISER, C. V. Birth Rates Among Rural Migrants in Cities. *Milbank Quart.* 16, 4:369 (Oct.), 1938.

Children's Carious Teeth—Although girls have more caries than boys of the same age, their teeth erupt earlier and hence have a longer time to decay. Allowing for this factor, it appears that girls are no more susceptible to dental caries than are boys. The moral is that conclusion jumping is a hazardous indoor sport.

KLEIN, H., and PALMER, C. E. Studies on Dental Caries. *Pub. Health Rep.* 53, 38: 1685 (Sept. 23), 1938.

Outlook for Education in Preventive Medicine—Recounting the growth of facilities for teaching preventive medicine to medical students, the author points to the recently created need for more trained medical health officers than the educational institutions can supply with their still limited training facilities in this field.

LEATHERS, W. S. Preventive Medicine. *J.A.M.A.* 111, 17:1517 (Oct. 22), 1938.

Nutrition and Child Development—Among a group of institutional children, a third were kept on the usual diet, a third were given a pint equivalent of evaporated milk in addition, and the remaining third the same amount of irradiated evaporated milk. As would be expected, the control children on a mediocre diet did not progress as well as those receiving supplementary milk, but those on irradiated milk did no better than those on plain.

MACNAIR, V., and ROBERTS, L. J. Effect of Milk Supplement on the Physical Status of Institutional Children. *Am. J. Dis. Child.* 56, 3:494 (Sept.), 1938.

Air Comfort—Dry-bulb thermometer readings are no index of comfort. Other instruments and indexes that

may be used in determining "effective temperature" are described in this excellent article which has so much significance in these days of super-air-conditioning.

MCCORD, C. P., and WITHERIDGE, W. V. Measurement of Air Conditions. *J.A.M.A.* 111, 18:1647 (Oct. 29), 1938.

Making the Sanatorium Prevent—The evolution of the modern tuberculosis sanatorium and its broadening functions in the control program are excellently presented in this paper which is of especial value to health administrators who should be concerned with the preventive features of the recently recreated nation-wide interest in that disease.

POPE, A. S. The Rôle of the Sanatorium in Tuberculosis Control. *Milbank Quart.* 16, 4:327 (Oct.), 1938.

Eminently Logical—New York City's tuberculosis control program is largely given over to case finding and most of the available services are devoted to the groups where the most good can be accomplished; that is, adults in susceptible racial and economic groups. The rapid roll paper method has proved convenient, inexpensive, and satisfactory.

ROBINS, A. B. Mass Case-Finding. *Am. Rev. Tuberc.* 38, 4:448 (Oct.), 1938.

Clinical Lecture—Proof that good prenatal care pays.

SCHWARTZ, O. H. Antepartum Care. *J.A.M.A.* 111, 16:1460 (Oct. 15), 1938.

Super-Eating—Once accepted as fundamental, that one cannot advantageously consume more food than one obviously needs, the statement is found to be over-simplified in the light of recent research in nutrition. What must be taught now is scientific discrimination in diet.

SHERMAN, H. C. Relation of Nutrition to Optimal Health. *J. Health & Phys. Ed.* 9, 7:406 (Sept.), 1938.

In Praise of Breast Feeding—

It is safe to assume, this British writer assumes, that 20 to 30 per cent of babies are artificially fed from birth, and that not more than a third are fully breast fed through the first 6 months. Mortality and morbidity rates are higher among artificially fed infants. Lactation is good for the mothers, too. How mothers can be induced to nurse their babies is considered at length.

SPENCE, J. C. The Modern Decline of Breast Feeding. *Brit. M. J.* (Oct. 8), 1938, p. 4057.

British Views on Epidemiology

—Droplets do not go around corners with any facility, if at all. That is why the cubicle system works in infectious wards. Scarlet fever nursed in cubicle wards showed no changes in

serologic types, but in multiple bed wards a majority of patients became reinfected with other types often to their disadvantage. Many other avenues for the spread both of respiratory and intestinal infections in these two interesting papers.

STALLYBRASS, C. O., and SMITH, H. G. Changing Views as to the Spread of Infection. *J. Roy. San. Inst.* 1, 13:769 (Oct.), 1938.

Housing Accommodations and Child Bearing—Pointing out the need for quantitative as well as qualitative considerations in housing, the author concludes that private enterprise can hardly be induced to provide housing units suited to a sound population of optimum size.

THOMPSON, W. S. The Effect of Housing Upon Population Growth. *Milbank Quart.* 16, 4:359 (Oct.), 1938.

ASSOCIATION NEWS

RESOLUTIONS PASSED AT KANSAS CITY

CERTAIN of the Resolutions passed at the 67th Annual Meeting in Kansas City are of such timely importance that they are printed below. Other Resolutions will appear in the *Association Year Book*.

It is particularly important that the official text of these Resolutions be read by all persons who are interested in just what the American Public Health Association has approved, especially in view of confused reports in the public press.

THE NATIONAL HEALTH PROGRAM

THE American Public Health Association, ever increasingly conscious of the leadership and competence which have characterized the work of the various federal health agencies, records its unanimous satisfaction in the further evidence of the effective interest of the federal government in the health of the nation, embodied in the recommendations of its Interdepartmental Committee to Coordinate Health and Welfare Activities to the National Health Conference, July 18-20, 1938.

There can be no doubt that large areas of many of our states do not enjoy the benefits of adequate health service. We maintain that without adequate local health organization covering every area of the United States, the delivery of the full benefits of modern public health procedure to all the people in the United States cannot be accomplished. We recognize further the indispensable services which state departments of health are capable of contributing over and above those provided under local governmental units in urban or rural communities.

In recognition of these facts, we endorse the recommendations presented before the National Health Conference by the Technical Committee on Medical Care, which propose the expansion of public health services, including necessary medical, hospital, and nursing care for the period of maternity and childhood in

families unable to obtain adequate care through their own resources.

An appraisal of national health resources reveals the existence of many communities in which hospital facilities are meager or lacking. The inadequacy of institutional facilities presents a handicap to the control of tuberculosis and mental disease, and deprives those requiring care in general hospitals of the full benefits of modern medical treatment. In certain communities adequately supplied with hospitals, economic barriers prevent their full utilization. For large numbers of our population, inadequate income results in inadequate medical and dental care. The concept of the close interrelation of preventive and curative medicine is basic to the modern public health program.

We therefore endorse the recommendations of the Technical Committee to the National Health Conference providing for federal aid to the states for the construction of additional hospital facilities, the provision of essential medical and nursing care, and hospital care as required, to persons unable to support such care from their own resources, and the compensation against wage loss incurred through sickness. In connection with the Technical Committee's recommendation concerning medical care, the Association supports the view that in the initiation and development of the program, wide latitude should be given to the states in the definition of the population to be served and the method of providing medical service.

We pledge the American Public Health Association to use all its professional resources, and such influence as it has earned through sixty-eight years of development and leadership in public health to aid governmental agencies in accomplishing those statesmanlike health objectives.

Furthermore, we offer our coöperation to the governmental agencies which may be charged with the proposed expansion of health services in the United States, and we stand ready to collaborate with other professional and scientific organizations having similar principles and objectives, to the end

that at the earliest possible date in every area under the jurisdiction of the United States the whole population may have the benefit of the best that public health service can bring them.

BE IT RESOLVED that the foregoing declaration expresses the formal and considered opinion of the American Public Health Association and that it shall be published in the *Journal*.

BE IT FURTHER RESOLVED that the Executive Board is hereby instructed to appoint a representative committee of seven Fellows of the Association to coöperate during the coming year with the Interdepartmental Committee of the United States Government, with the American Medical Association, the American Dental Association, the National Organization for Public Health Nursing, the Conference of State and Territorial Health Officers and with other agencies, to the end that these principles may be translated into effective action.

APPRECIATION OF PARTICIPATION

BY DR. IRVIN ABELL.

THE American Public Health Association records its appreciation of the participation in its deliberations during this Annual Meeting week of Dr. Irvin Abell, President of the American Medical Association. It records with pleasure its agreement with the approval in principle, at a recent special session of the House of Delegates of the American Medical Association, of the content of the national health program presented by the Interdepartmental Committee to the National Health Conference. The Association pledges its continued coöperation and support to the American Medical Association in the translation of this policy into action.

EFFECTIVE CONTROL OF DRUGS

WHEREAS, it appears that the health and welfare of the American public are being jeopardized in a large way by an enormous volume of drug preparations advertised and sold through consumer channels for self-medication; and,

WHEREAS, the federal government through the passage of the Wheeler-Lea Amendment and the Copeland Act at the last session of the National Congress, is now equipped to deal adequately from a federal standpoint with abuses involving harmful and dangerous drugs as well as false and misleading advertising of every description in regard to food, drugs and cosmetic preparations offered for sale in interstate traffic, be it, therefore,

RESOLVED that the American Public Health Association, through its constituent member-

ship and allied health organizations exert every possible effort to coöperate with the federal government in the realization of these most laudable objectives; and to this end, be it further

RESOLVED that the American Public Health Association recommend to those state health departments having jurisdiction over food and drug control, that steps be taken as expeditiously as possible to revise the existing state laws, if necessary, so as to harmonize with the federal regulations in order that complete coördination and mutual coöperation may be effected, and all unnecessary duplication be eliminated.

BASIC REQUIREMENTS FOR MEDICAL PRACTICE AND THE USE OF ANIMALS IN SCIENTIFIC RESEARCH

WHEREAS, despite the fact that one of the proudest chapters in the history of American Medicine is the improvement in training and professional qualifications of American physicians, there is still occasional evidence of lack of understanding by some groups of the general public of these accomplishments. From time to time in the various states and sections of this country there appear legislative proposals inimical to the continued progress of scientific medicine and public health. Many of these proposals if passed would seriously injure the health of the public and prove serious obstacles to biological research and curative and preventive medicine.

RESOLVED that the American Public Health Association hereby records its firm conviction that those who would practise the healing arts and sciences must be thoroughly trained in the basic sciences such as anatomy, chemistry, physics, physiology, bacteriology, and the like, as well as in the clinical subjects such as medicine, preventive medicine, surgery, pediatrics, obstetrics, and the like, and that such training requires a minimum of high school graduation, two years of academic college study, four years in a recognized Class A medical school, and one year of internship in an approved hospital or laboratory.

That minimum standards of training now upheld by Class A medical schools in the United States are reasonable and proper, and that none should administer to the sick in the capacity of physician without having met these requirements or their full equivalent and without being licensed to practise medicine by a state medical examining board.

BE IT FURTHER RESOLVED that the American Public Health Association considers laboratory work with animals essential to re-

search into the still unknown areas in biology, medicine, preventive medicine, surgery, therapeutics, and public health. That even as we are dependent for our food supply on the lower animals, so likewise are we dependent upon the so-called laboratory animals for sera, vaccines, and other medicines which result in enormous savings of both human and animal life;

That restriction of the supply of such animals to any responsible institution or organization engaged in medical training, scientific research or manufacture of therapeutic agents would be a serious menace to the public health.

NEW AFFILIATED SOCIETIES

AT the Annual Meeting of the A.P.H.A. in Kansas City, three state public health associations were approved as Affiliated Societies of the American Public Health Association, making a total of nineteen. Names of these new societies and their officers are:

Arizona Public Health Association
President—George F. Manning, M.D., Flagstaff
President-Elect—W. W. Peter, M.D., Window Rock
First Vice-President—Noel McKeehan, Phoenix
Second Vice-President—Beth Woolfolk, Phoenix
Secretary-Treasurer—Marion E. Stroud, Phoenix

Colorado Public Health Association
President—A. L. Beaghtler, M.D., Denver
Vice-President—Roy L. Cleere, M.D., Denver
Treasurer—Omer Gillett, M.D., Colorado Springs
Acting Secretary—Marie P. Fackl, M.D., Denver

Utah Public Health Association
President—L. L. Daines, M.D., Salt Lake City
President-Elect—S. G. Paul, M.D., Salt Lake City
Treasurer—D. C. Houston, Salt Lake City
Secretary—S. E. Gilchrist, Salt Lake City

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Leonides A. Almazan, M.D., Paseo Reforma 10, Mexico City, Mexico, Chief, Public Health Dept. of Mexico
 Henry H. Asher, M.D., Ozark, Mo., District State Health Officer
 Huston J. Banton, M.D., M.P.H., Fort Riley, Kans., Director of Laboratory and Assistant Inspector
 J. Nelson Barger, M.D., Albany, Mo., County Health Officer
 Edgar A. Belden, M.D., 811 Virginia Ave., Columbia, Mo., District State Health Officer
 Arnold S. Benson, M.D., 30 Island Ave., Aurora, Ill., Health Commissioner
 Claude M. Eberhart, M.D., 1009 Broadway, Highland, Ill., District Health Supt., State Dept. of Public Health
 Charles F. Engelking, M.D., C.P.H., 76 S. Thornton Ave., Dalton, Ga., Whitfield County Commissioner of Health
 Floyd B. Gillespie, M.D., Fairbanks, Alaska, Deputy Commissioner of Health
 Phares Y. Greene, M.D., Graham, N. C., Alamance County Health Officer

Beatrice T. Hagen, M.D., Court House, Zanesville, O., Muskingum County Health Commissioner
 Fred P. Helm, M.D., State Board of Health, Topeka, Kans., Secretary and Executive Officer
 Forrest A. Kelley, M.D., 103½ E. 9th, Winfield, Kans., Cowley County Health Officer
 Ralph R. Kelley, M.D., Savannah, Mo., County and State Deputy Health Officer
 Lawrence J. Linck, 414 S. Boulevard, Evanston, Ill., Director, Chicago Syphilis Control Project and Special Consultant, Division of Venereal Diseases, U. S. Public Health Service
 Hugh B. Martin, Municipal Bldg., Englewood, N. J., Health Officer
 Grady F. Mathews, M.D., Tahlequah, Okla., District State Health Officer.
 Herbert L. Newcombe, M.D., M.P.H., South Central District Health Unit, Twin Falls, Idaho, Assistant Director
 L. A. Proctor, M.D., 112½ S. 18th, Parsons, Kans., Health Officer
 Albert J. Randall, M.D., 723-56 St., Kenosha, Wis., Director of Public Health

Howard G. Romig, M.D., Anchorage, Alaska,
Assistant Health Commissioner

Dr. Severi Savonen, Yrjonkatu, Helsinki, Fin-
land, Secretary, Finnish National Anti-
Tuberculosis Assn.

Richard Sears, M.D., White Cloud, Mich.,
Director, District Health Unit 5

Joseph W. Spearing, M.D., P. O. Box 403,
Cimarron, Kans., County Health Officer

George C. Stucky, M.D., Eaton County Health
Dept., Charlotte, Mich., Director

J. V. Van Cleve, M.D., 906 Brown Bldg.,
Wichita, Kans., Director of Syphilis Clinic,
Sedgwick County Clinic and Hospital

Theodore L. Waddle, M.D., Dexter, Mo., Dis-
trict State Health Officer

Roy A. Walton, M.D., D.P.H., 41 Ave. and
Fraser St., Vancouver, B. C., Canada, Direc-
tor, Metropolitan Health Unit 4

Anderson F. Whitsitt, M.D., C.P.H., Chester-
town, Md., Deputy State Health Officer and
Kent County Health Officer

Laboratory Section

Flora H. Acton, 1305 W. 16 St., Topeka,
Kans., Bacteriologist, State Public Health
Laboratory

L. H. Allwardt, D.Sc., 121 W. Main St.,
Chillicothe, O., Bacteriologist, Dept. of
Health

Jean Christopher, Public Health Laboratory,
Topeka, Kans., Bacteriologist

R. J. Gibbons, M.D., Laboratory of Hygiene,
John & Sussex Sts., Ottawa, Ont., Canada,
Senior Bacteriologist

Alfred G. Karlson, D.V.M., 914 W. Center,
Rochester, Minn., Fellow, Mayo Founda-
tion for Medical Education and Research

Frederick C. Mortensen, Ph.D., Station Hos-
pital, Fort Leavenworth, Kans., Captain,
Sanitary Corps, U. S. Army

Murrell O. Robinson, V.M.D., Box 263,
Auburn, Ala., Professor of Bacteriology,
Alabama Polytechnic Institute

Robert M. Shaw, M.D., D.P.H., Provincial
Laboratory, Univ. of Alberta, Edmonton,
Alta., Canada, Professor of Bacteriology and
Hygiene

Henry C. Sweany, M.D., 5601 N. Pulaski Rd.,
Chicago, Ill., Medical Director, Research
and Laboratories, Chicago Municipal Tubercu-
losis Sanitarium

Harriette D. Vera, Ph.D., Dept. of Physiology,
Goucher College, Baltimore, Md., Instruc-
tor in Bacteriology

Vital Statistics Section

Wayne F. Caskey, Ph.D., 2312 S. Nash St.,
Arlington, Va., Head. Admr. Studies Unit,
Bureau of Old-Age Insurance, Social Se-
curity Board

Frances Idol, 1100 W. Main St., Jefferson
City, Mo., Assistant State Registrar

Francis E. Kester, State Board of Health,
Madison, Wis., Acting Director of Vital
Statistics

Margaret D. Lang, State Dept. of Health,
Bismarck, N. D., Director, Division of
Vital Statistics

Gordon N. Perry, Bureau of Economics and
Statistics, Parliament Bldgs., Victoria, B. C.,
Canada, Director

Public Health Engineering Section

Buford D. Baker, 2619 Indiana, Topeka,
Kans., County Sanitarian

Lewis Dodson, 2410 Seton, Austin, Tex.,
Itinarat Instructor of Sewage and Sanita-
tion, State Dept. of Education

Glen A. Harwell, Osceola, Mo., Public Health
Engineer, State Board of Health

John A. Logan, 1613 E. Broadway, Columbia,
Mo., Instructor in Sanitary Engineering,
University of Missouri

Richard M. McLaughlin, 17 Merritt Ave.,
White Plains, N. Y., Acting Director,
Division of Sanitation, Westchester County
Dept. of Health

George D. Newton, Fulton County Health
Dept., Atlanta, Ga., Sanitary Engineer

M. W. Pirkle, City Hall, Marietta, Ga., Act-
ing Division Engineer, State Dept. of Public
Health

M. Dwight Sanders, Swift & Co., Union
Stock Yards, Chicago, Ill., Research and
Development in Industrial Waste Treatment

Ivan F. Shull, 300 S. Broadway, Wichita,
Kans., County Sanitarian

James H. Stephens, State Board of Health,
Columbia, S. C., Sanitary Engineer, Field
Training Unit

J. Harold Tillman, 2730 Wheeling St., El Paso,
Tex., Sanitarian, City-County Health Dept.

Ben L. Williamson, Rm. 15, Marvin Hall,
Univ. of Kansas, Lawrence, Kans., Asst.
Engineer, Division of Sanitation, State
Board of Health

Industrial Hygiene Section

Frederick H. Goldman, Ph.D., National Insti-
tute of Health, Washington, D. C., Chemist,
Division of Industrial Hygiene, U. S. Pub-
lic Health Service

Richard D. Mudd, M.D., Ph.D., Chevrolet-
Grey Iron Foundry, Saginaw, Mich., Med-
ical Director

Food and Nutrition Section

Raoul F. Cowley, Ave. de Belgica 7, Alturas
de Almendares, Marianao, Cuba, Technical
Adviser, National Technical Milk Com-
mission of Cuba

Graphs: How To Make and Use Them—By *Herbert Arkin and Raymond R. Colton*. New York: Harper, 1936. 224 pp. Price, \$3.00.

This book should be on bookshelves next to "Statistical Methods" by the same authors. It is the first book on graphs in which we have seen all of the "tricks of the trade" listed.

The first three chapters are devoted to principles, construction, and equipment, in which are set forth the various kinds of paper, pens, inks, and lettering guides. Separate chapters are devoted to the different types of charts where in each case may be found a list of common errors to avoid. The authors cite rules for titles and footnotes which if followed would take the curse off many charts. They also stress the point that charts should be simple and should tell one story, not many. Chapters are also given to reproduction of graphs and the preparation of statistical tables and reports. There is also a complete index.

The entire book is written in the simple straightforward style that made *Statistical Methods* so valuable.

While it does not confine itself to the presentation of public health statistics all of the material is applicable to this field and it will be of great assistance to anyone interested in or concerned with modern graphic presentation of public health statistics for both the lay public and the professional groups.

E. J. CROSS

How To Live—By *Irving Fisher, LL.D., and Haven Emerson, M.D.* (20th ed.) New York and London: Funk and Wagnalls, 1938. 422 pp. Price, \$2.50.

A book which has reached its 20th edition and the worth of which has been recognized in every part of the United States, does not call for a review—only an announcement of a new edition. However, this last volume

sees Dr. Haven Emerson as co-author with Professor Irving Fisher in place of the late Dr. Eugene Lyman Fisk, who was associated with Professor Fisher in getting out the earlier editions, and to whose memory the book is now dedicated.

This edition has followed the earlier ones in bringing the subject matter up to date and in presenting the most recent authoritative conclusions on each subject discussed. The authors regard the book as unique and even radical in its recommendations, but properly hold that it is based on the work of conservative advisers and hope that they are just a little ahead of the world, which will eventually catch up with them.

A striking feature is the 32 appendices, each by a specialist in his field. These appendices constitute approximately two-thirds of the volume. A good index adds to the value. It should be noted that the royalties from the sale of this book will be donated to meet the expense of the Vitality Records Office through which valuable information is being collected as to the influence of habits on health.

It can be recommended without reserve. It will unquestionably maintain the high place in the regard of the public earned in the past.

MAZÛCK P. RAVENEL

The Radiology of Pulmonary Tuberculosis—By *J. E. Bannen, M.B., Ch.B., D.M.R.E.* Baltimore, Md.: Wood, 1937. 156 pp. Price, \$4.50.

This is an excellent synopsis of the subject. To those in public health work who desire to refresh themselves concerning the pathology of the lungs as revealed by X-ray, it should be of inestimable help.

There is a good chapter on the physical examination of the chest and the clinical aspects of pulmonary tuberculosis. The illustrations are adequate

Nelle R. Morris, 3027 Summit St., Sioux City, Ia., Director, Public Health Nursing
 Pearl Nelson, Cameron, Mo., District Health Nurse

Mary O'Mara, R.N., Yates Center, Kans., Woodson County Public Health Nurse

Manila Robbins, R.N., Box 343, Lyons, Kans., County Public Health Nurse

Hazel I. Roberts, R.N., District Health Service, Manchester, Ia., Public Health Nurse

Iva E. Schieswohl, 3632 Hickory Ave., Baltimore, Md., Supervising Nurse, City Health Dept.

Margaret Shadoan, R.N., 1028 Perry, Wichita, Kans., Tuberculosis Control Nurse, Sedgwick County Health Dept.

Laura M. Slaybaugh, 410 E. 9th, Topeka, Kans., Shawnee County Health Dept.

Olivia Smythe, Tahlequah, Okla., Supervising Nurse, State Dept. of Health

Genevieve R. Soller, R.N., 115 Pearl, Ypsilanti, Mich., School Nurse, Ann Arbor Public Schools

M. Alberta Swain, 1407 W. Maple, Independence, Mo., School Nurse, Sugar Creek Public School

Laura Van De Mark, R.N., 125½ N. W. 30th, Oklahoma City, Okla., Director of Nurses, State Dept. of Health

Mary G. Vossen, R.N., 150 S. St. Clair, Wichita, Kans., Venereal Disease Control Nurse, Sedgwick County Dept. of Health

Mayme I. Walker, 2420 N. Sherman, Kansas City, Kans., Nurse, City Health Dept.

Ethel A. Wilkins, R.N., P. O. Box 802, Dodge City, Kans., City and School Nurse

Sybil E. Wilson, Kirksville, Mo., District Health Nurse, State Board of Health

Epidemiology Section

Philip E. M. Bourland, M.D., M.S.P.H., Dickinson County Health Dept., Iron Mountain, Mich., Director

Francisco A. Cardoso, M.D., Caixa Postal 1985, Sao Paulo, Brazil, S. A., Assistant

Professor of Hygiene, Instituto de Higiene

Frank W. Parker, Jr., M.D., C.P.H., 214 E. Buena Vista St., Santa Fe, N. Mex., Epidemiologist, State Dept. of Public Health

Unaffiliated

Maurice B. Bender, M.D., 50 Union Square, New York, N. Y., Medical Director, Guardian Life Ins. Co.

Maude M. Gerdes, M.D., Children's Bureau, Washington, D. C., Obstetrical Consultant, Maternal and Child Health Division

Phoebe M. Kandel, Colo. State College of Education, Greeley, Colo., Professor of Nursing Education

P. A. Kibbe, M.D., State Board of Health, New Orleans, La., State Registrar of Vital Statistics

E. H. Lindstrom, M.D., 11 Edwards St., Helena, Mont., Medical Director, Western Life Ins. Co.

Clara Mears, R.N., 805 Ohio St., Lawrence, Kans., County Public Health Nurse

Clifford R. Taylor, D.D.S., 1132 White, Ann Arbor, Mich., Trainee (Director of Dental Health Appointee for South Dakota)

STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS

CHANGES IN NEW EDITION

THE following are the most important changes in *Standard Methods of Milk Analysis* (new title *Standard Methods for the Examination of Dairy Products*) as approved by the Laboratory and Food and Nutrition Sections of the American Public Health Association at the Annual Meeting in Kansas City, Mo., October 25-28, 1938.

1. The Seventh Edition of this report is to include Bacteriological Methods prepared by a Committee from the Laboratory Section, Bioassay Methods for Vitamin D Milk prepared by a Committee from the Food and Nutrition Section, and Chemical Methods prepared by the Association of Official Agricultural Chemists.

2. The scope of the report has been broadened to cover Dairy Products, in general. The Ice Cream Section, which now includes methods for making bacterial counts for Plain Ice Cream only, is to be still further developed during the coming year in coöperation with the Joint Committee on Standard Methods for the Examination of Frozen Desserts maintained by the Laboratory, and the Food and Nutrition Sections to cover the broader field of Frozen Desserts. Methods for making Yeast and Mold Counts from butter are also included. A Referee on Sediment Tests for all dairy products is to be appointed.

3. Part I Bacteriological Methods is divided into eleven sections. The first five sections cover sampling, methods of making agar plate counts, direct microscopic counts, the methylene blue reduction technic and sediment tests. The four following sections describe methods for the isolation and identification of coliform bacteria, hemolytic streptococci, tubercle bacilli, and the organisms that cause undulant fevers, respectively. Section 10 includes the ice cream methods, and Section 11 the butter methods.

4. The text of the bacteriological portion of the report has been entirely rewritten and arranged in a more logical sequence. A de-

tailed subject Index is to be prepared, in addition to the Table of Contents.

5. The following are the most important changes approved in the Standard Agar Plate Count technic:

(a) Beginning July 1, 1939, standard agar is to have the following composition and reaction:

Bacto-Tryptone .	5 gr.	
Bacto-ment extr.	3 gr.	
Glucose	1 gr.	
Skim milk	10 c.c.	(Where dilutions are
Agar	15 gr.	greater than 1:10)
Reaction	pH 6.6 to 7.0	
Preferred reaction	7.0	

(b) While incubation at 37° C. (not 37.5° C.) is to be continued until laboratories doing milk work are more generally equipped with approved incubators, the variation in temperature permitted was placed at 35 to 37° C., rather than 35.5 to 37.5° C., as at present.

(c) As a result of the findings of various research workers, it is required that agar plates be counted under constant illumination and the use of the Quebec Colony Counter is strongly recommended.

(d) The recommendations regarding types of laboratory incubators and incubator rooms as given in the present (Sixth) edition are made mandatory so that the only incubators approved are the water jacketed and anhydric laboratory type incubators with low temperature heating units operating at temperatures only slightly in excess of 37° C.; and incubator rooms of proper construction.

(e) Specifications for pipettes, dilution bottles, non-absorbent closures, etc., have been drawn up in greater detail than previously.

(f) Methods have been developed for making more accurate rinse counts from glass and paper milk bottles that are nearly sterile.

6. The uses of the direct microscopic method and particularly its usefulness for the examination of pasteurized milk have been described in greater detail than previously. It is required that all agar plate counts be checked microscopically frequently enough to detect the presence of excessive numbers of

bacteria present in the milk and cream where they do not grow on standard agar plates incubated at 37° C. It is only by checking in this way that all samples containing excessive numbers of bacteria can be detected. A high class milk supply does not contain an excessive number of bacteria, either living or dead.

7. (a) The methylene blue thiocyanate tablets approved at the New Orleans meeting (1936), having been standardized and found satisfactory in actual use, are accepted as standard.

(b) Reference is made to the modified form of the methylene blue reduction technic now officially approved in England.

(c) No reference is made to the resazurin test as it is felt that further study must be made before the significance of the results secured by this technic will be evident.

8. Improvements have been made in the text covering the sediment technic. The suggested 1937 Connecticut State Standards are included.

9. Brilliant green lactose bile broth, sodium formate ricinoleate broth, violet red bile agar, and sodium desoxycholate agar are approved for use in detecting coliform bacteria in dairy products.

10. Methods for plating on blood agar and the use of Burri agar slants are given in the section on methods of detecting pathogenic, usually hemolytic streptococci. Cross reference is made to the report prepared by the Committee on Diagnostic Procedures and Reagents of the Laboratory Section which gives methods of identifying species of streptococci by cultural and serological procedures. These are to be used where exact identification of species is desired.

11. The tentative methods for the identification of tubercle bacilli in milk and cream as

given in the *Year Book* for 1934-1935 are now included as standard methods.

12. The tentative methods for the identification of bacteria belonging to the genus *Brucella* as given in the *Year Books* for 1934-1935 and 1935-1936 are now included as standard methods.

13. Little change has been made in the section describing methods for making bacterial counts from plain ice cream. It is expected that this section will be rewritten in the near future in coöperation with the Committee on Standard Methods for the Examination of Frozen Desserts.

14. Directions for carrying out yeast and mold counts on butter are given for the first time. No directions for making sediment tests from butter are given as yet. These methods are under study in coöperation with referees working with similar methods for other dairy products.

15. The directions given in Part II for the Bioassay of Vitamin D milk are based on the directions for this method as given in the *U.S. Pharmacopoeia*, Supplement, p. 91, and are in harmony with the directions adopted by the Association of Official Agricultural Chemists.

It is expected that the new (Seventh) edition of the report will be in print during the early part of 1939.

COMMITTEES ON STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS

ROBERT S. BREED, *Chairman*
FRIEND LEE MICKLE, *Chairman*
Frozen Desserts
HENRY T. SCOTT, *Chairman*
Vitamin D Bio-assay of Milk

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge. Public health nurses are registered with the Nurse Placement Service, 8 South Michigan Avenue, Chicago, Ill., with which the Association coöperates.

Replies to these advertisements, indicating clearly the key number on the envelope, should be addressed to the American Public Health Association, 50 W. 50 Street, New York, N. Y.

POSITIONS AVAILABLE

WANTED—(a) County health commissioner; public health training and experience required; southeast. (b) Young physician, under 35, for position with state department of health; must be willing to take course of training before being assigned to duty. (c) Young public health man for interesting position in southwest; special training in either obstetrics or pediatrics desirable; woman eligible. (d) School nurse; college graduate, 30-40, with public health certificate; full charge in small town school system with total enrollment of 900; ability to launch sex education program for students and mothers important; minimum \$1,700, increasing annually; immediately available, Chicago area. (e) Instructor in bacteriology and public health; degree in bacteriology from medical school required; state university school; considerable research. (f) City health commissioner; physician with minimum 5 years' experience required; one 40-45 with C.P.H. or M.P.H. preferred; \$5,000; South. Write: 120, Medical Bureau, Pittsfield Building, Chicago, Ill.

POSITIONS WANTED

Physician, M.D., University of Virginia; excellent background, seeks position as health officer in well organized health department. A388

Physician, M.D., Class A medical school; M.S.P.H., University of Michigan, 1937; now serving as district state health officer, seeks full-time administrative position in city or county. A367

Physician, experienced in health administration of cities and states, will consider attractive opening in maternal and child health or health education. A343

Well qualified physician, with C.P.H. from Johns Hopkins; experienced as school physician and in college teaching, will consider city or county administrative position or teaching and student health service. A383

Physician, M.D., University of Cincinnati; with postgraduate training in venereal disease control, Johns Hopkins; now employed, is available as venereal disease control officer. A363

Physician, M.D., C.P.H., 2 years' experience as district health officer; anxious to do venereal disease control work or epidemiology. A345

Physician, M.D., A.B., 30 years city health department. Administrative, educational and research experience; also familiar with venereal disease work. A295

Physician, age 34; M.D., University of Wisconsin; M.P.H., Harvard; specializing in industrial hygiene, will consider general administration. A342

HEALTH EDUCATION

Well qualified woman in health education wishes position as health coördinator or health counselor. Has wide experience, and Ph.D. from New York University. H236

Young woman, M.A., Health Education, Teachers College, Columbia University; with splendid international experience, seeks position as director of health education with preference for New York City. H369

Young woman, M.S.P.H., University of Michigan, experienced in laboratory research and health education, is available for research or investigative work. H303

Woman, M.D., Boston University; special work Columbia and Massachusetts Institute of Technology; one year's experience in state hospital; interested in psychiatry, desires position in the east in hospital for mental diseases or industrial school. H247

MATERNAL AND CHILD HEALTH

Woman physician, graduate of University of Iowa, who has directed state bureau of maternal and child health, now employed, will consider another position. C318

Woman physician, with excellent medical training and background of public health nursing experience, seeks position in maternity and infancy work. C376

LABORATORY

Bacteriologist and pathologist with wide administrative experience; Ph.D., Brown University; will consider leading position in this field. L371

(Continued on p. 1450)

Experienced laboratory director with background of dairy products manufacture and research in control methods; University of Wisconsin, M.S. and Ph.D.; desires administrative position with food manufacturing or processing industry, or association with health department doing routine and research work in food control. L381

Capable research worker; Ph.D., trained at University of Southern California and Pasteur Institute, seeks position directing laboratory, in research work or field investigation. Has taught bacteriology, directed state hygiene laboratory and hospital laboratories. L315

Young woman, A.B., Bates College; several years' experience in various state laboratories, desires position as bacteriologist. L253

Bacteriologist with training at C.C.N.Y., N.Y.U. and Cornell Medical College, wishes laboratory position in bacteriology; east or southwest. M351

Young woman, A.B., major in bacteriology; 9 years' experience; now employed in a clinical laboratory; desires position in bacteriology or serology in a health department laboratory or in research. L382

Laboratory technician, B.Sc. degree; with experience in Army, state public health laboratory, and U. S. Public Health Service field laboratory, seeks position in medical school or university. L379

Bacteriologist and serologist, A.B., University of Kansas; at present bacteriologist in charge, public health laboratory; will consider another position. L390

SANITARY ENGINEERS

Sanitary engineer; courses at Rutgers University; with 17 years' experience in design, research and construction of water and sewage plants, as well as aerial pollution surveys; desires position, preferably research. E321

Graduate sanitary engineer with service under U.S.P.H.S. and state departments of health, especially interested in filtration plant design and operation and shellfish sanitation, seeks employment. E356

Public Health engineer, B.S. in Sanitary Engineering, from Massachusetts Institute of Technology, experienced in Massachusetts, Connecticut and Kentucky, seeks position as sanitary or public health engineer with health department. E380

Experienced sanitary engineer, graduate of Massachusetts Institute of Technology, seeks responsible position. E372

MISCELLANEOUS

Young man, age 27, S.B., Massachusetts Institute of Technology; A.M., Boston Uni-

versity; M.S. in Biochemistry, University of Michigan; 2 years' graduate work in public health; experienced in chemical, bacteriological and biochemical research; teaching experience in college hygiene, desires a position in a food industry involving research or control. M374

Experienced teacher in bacteriology and public health; Ph.D., Cornell; now professor in Grade A medical school, will consider teaching, executive or administrative position. M327

Experienced public health nurse executive, Fellow A.P.H.A., is available for responsible position. N384

Industrial hygiene engineer, B.S. in Chemical Engineering, S.M. in Sanitary Engineering (Industrial Hygiene) from Harvard Graduate School of Engineering; field experience; desires position with public health department or private health agency. M391

SITUATIONS WANTED: (a) *Young physician*: B.S., M.D. degrees, leading schools; graduate courses in physiologic hygiene, community health problems and epidemiology, hygiene and public health; age 31; will go anywhere. (b) *Young woman physician*: extensive graduate training in pediatrics; 4 years, child hygiene division, state health department; several years, private practice pediatrics; wishes to return to full-time public health work. (c) *Public health nurse*, B.A. degree; graduate of one of country's leading training schools; postgraduate training public health and hygiene, state university. (d) *Health educator*; graduate nurse, with B.S. degree; social service certificate; 3 years' experience social service; 4 years, industrial nursing; 10 years, director of health council. (e) *Bacteriologist*, A.B., M.S. degrees, state university; ten years, city bacteriologist and chemist, city health department. WRITE: 121, Medical Bureau, Pittsfield Bldg., Chicago, Ill.

POSITIONS AVAILABLE

District Health Officer; 3 Vacancies; Salary \$4,750. Applicants must have been residents of the City of New York for 3 years at the time of appointment. Duties: Administrative charge of the activities of Health Department in a district of about 250,000 population. Requirements: M.D. degree, 1 or more years of graduate training in public health, and 2 years' experience as a health officer or 3 years' experience in a responsible administrative position of the type which will fit one to be a health officer. Applications: Open December 7 to 28, 1938. For further details apply to Municipal Civil Service Commission, Municipal Bldg., New York City.

NEWS FROM THE FIELD

DELTA OMEGA OFFICERS

IN connection with the American Public Health Association meeting at Kansas City, Delta Omega, the honorary society in Public Health, held its annual meeting on October 25. Of the 749 living members, 90 were present. The society has six chapters in institutions offering courses which lead to degrees in public health.

The officers for the ensuing year are: Dr. John Sundwall, of Ann Arbor, Mich., President; Dr. M. E. Barnes, of Iowa City, Ia., Vice-President; and Dr. Clarence L. Scamman, 41 E. 57th St., New York City, Secretary-Treasurer.

A NEW FORM OF BIOLOGICAL ABSTRACTS FOR 1939

A NEW plan for the publication of *Biological Abstracts* beginning with 1939 has been adopted by the Board of Trustees. It provides for the usual monthly issue of abstracts covering promptly a definite list of journals in all fields of biology. To meet the demands of biologists who wish to subscribe for a special group of subjects, the whole issue will be broken up into five parts:

I. *General Biology*, to include General Biology, Biography-History, Bibliography, Evolution, Cytology, Genetics, Biometry and Ecology.

II. *Experimental Animal Biology*, to include Animal Physiology, Nutrition, Pharmacology, Pathology, Anatomy, Embryology, and Animal Production.

III. *Microbiology and Parasitology*, to include Immunology, Bacteriology, Viruses, Parasitology, Protozoölogy, and Helminthology.

IV. *Plant Sciences*, to include Phytopathology, Plant Physiology, Plant Anatomy, Palaeobotany, Systematic Botany, Agronomy, Horticulture, Forestry, Pharmacognosy, and *Palaeobotanical Botany*.

V. *Palaeozoölogy*, to include Palaeozoölogy, Protozoölogy, Helminthology,

Systematic Zoölogy, and Economic Entomology.

Subscribers to any of these parts will receive the indexes to the whole of *Biological Abstracts*.

To insure close contact on the part of biologists in every field with this service being conducted for them, the National Societies concerned are being invited to set up committees to help develop standards and editorial policies in their respective fields.

Biological Abstracts exists on a self-supporting basis, operates without profit, and sells its service at cost. For further information apply to the Business Manager, *Biological Abstracts*, University of Pennsylvania, Philadelphia, Pa.

"TYPHOID MARY" DIES OF STROKE AT 68

THE first carrier of typhoid bacilli identified in America and consequently known as Typhoid Mary, Mary Mallon, died November 11 in Riverside Hospital on North Brother Island, New York.

With the exception of a 5 year period from 1910 to 1915, this isolated spot in the East River had been her home since 1907, when she was discovered by George A. Soper, engineer and sanitary expert, and found to be a veritable peripatetic breeding ground for the bacilli. Fifty-seven original cases and 3 deaths had been attributed to her.

PSITTACOSIS ORDINANCES IN BALTIMORE

A CITY ordinance has been enacted in the City of Baltimore in order to prevent the reappearance of psittacosis or parrot fever.

This ordinance prohibits the importation, breeding, sale or distribution of birds of the psittacine family.

VIRGINIA ANNOUNCES FREE ANTI-SYPHILIS DRUGS

THE Virginia State Health Department has announced that free anti-syphilitic drugs are available to the medical profession for the treatment of all cases of syphilis, regardless of the patient's economic status. *The Virginia Medical Monthly* reports that health officers in cities and counties served by a full-time health department have been furnished a supply of drugs for distribution to hospitals, clinics and private physicians in their respective territories.

Physicians practising in territories not served by a full-time health department are to forward their requisitions to the State Health Department.

CHRISTMAS MEETING OF CANADIAN PUBLIC HEALTH ASSOCIATION

THE Laboratory Section of the Canadian Public Health Association will hold its Seventh Annual Christmas meeting in Toronto, December 19 to 21.

John Gordon, M.D., Ph.D., Professor of Hygiene and Preventive Medicine of Harvard University, will be the guest speaker.

HOSPITAL FOR DRUG ADDICTS

THE U. S. Public Health Service Hospital for drug addicts at Fort Worth, Texas, was dedicated recently.

This is the second such institution in the country, and was built at a cost of approximately \$4,000,000.

NEW TYPHUS ANIMALS

SIX new species of animals native to America have been added to the list of those susceptible to endemic typhus fever, and therefore possible intermediate reservoirs of infection which may be tapped by insects and thus transferred to man, the U. S. Public Health Service reported.

The gray and fox squirrel, the cottontail and swamp rabbit, the chipmunk and the skunk have been found to match the typhus classification of the woodchuck, flying squirrel, opossum, and the meadow, whitefooted, oldfield, cotton and golden mouse and the wood, cotton and rice rat.

MICHIGAN PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

NEW officers for the forthcoming year were elected as follows by the Michigan Public Health Association at its recent annual meeting:

President—John Lavan, M.D., Grand Rapids

Vice-President—M. R. Kinde, M.D., Battle Creek

Secretary-Treasurer—Marjorie Delavan, Lansing

Representative on A.P.H.A. Governing Council—Don W. Gudakunst, M.D., Lansing

TEXAS PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

AT its recent Annual Meeting the Texas Public Health Association elected the following officers to serve for the next year:

President—Walter Kleberg, M.D., Galveston

1st Vice-President—Graham Hatch, Dallas

2nd Vice-President—Mildred Garrett, R.N., Austin

3rd Vice-President—C. B. Young, M.D., Tyler

Secretary-Treasurer—P. A. Kerby, Austin

WEST VIRGINIA PUBLIC HEALTH ASSOCIATION ELECTS OFFICERS

AT its recent Annual Meeting, the West Virginia Public Health Association elected the following officers to serve during the coming year:

President—Edwin Cameron, M.D., Morgantown

Vice-President—Bruce H. Pollock, M.D., Point Pleasant

Second Vice-President—Claude A. Thomas, M.D., Martinsburg

Secretary—Harry K. Gidley, Charleston

MISSISSIPPI VALLEY MEDICAL SOCIETY
1939 ESSAY AWARD

THE Mississippi Valley Medical Society offers \$100, a gold medal, and a certificate of award for the best unpublished essay on a subject of interest and practical value to the general practitioner of medicine. Entrants must be members of the American Medical Association. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society at Burlington, Iowa, September 27, 28, 29, 1939, the Society reserving the exclusive right to first publish the essay in its official publication — the *Mississippi Valley Medical Journal (Incorporating the Radiologic Review)*.

Contributions must not exceed 5,000 words, be typewritten in English in manuscript form, submitted in 5 copies, and must be received not later than May 1, 1939. Further details may be secured from Harold Swanberg, M.D., Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Ill.

MICHIGAN BUREAU OF PUBLIC HEALTH
NURSING

A BUREAU of Public Health Nursing has been established as one of the administrative divisions of the Michigan Department of Health.

Miss Helen Bean, Public Health Nursing Consultant with the Division of Domestic Quarantine of the U. S. Public Health Service, has been appointed Director of this new bureau.

SYLVATIC PLAGUE LABORATORY

THE University of California is to be equipped with a laboratory for the study and control of sylvatic plague.

This work will be under the leadership of Dr. Karl F. Meyer, Director of the George Williams Hooper Foundation of the University, and Chairman of

the Committee on Sylvatic Plague of the Western Branch A.P.H.A.

ARKANSAS EMPLOYS DENTISTS

FIFTEEN part-time dentists have been employed by the Arkansas State Board of Health to conduct dental health programs in full-time county units.

MORE PUBLIC HEALTH NURSING IN 1937

SEVEN and one-half per cent more public health nurses were employed in 1938 than in 1937, according to a report released by the U. S. Public Health Service and the U. S. Children's Bureau.

These statistics, collected through the state health departments, show that 23,271 public health nurses were employed in 1938 as compared with 21,656 in 1937.

NATIONAL RESOURCES COMMITTEE
REPORTS

THE National Resources Committee has reported on drainage base problems and programs and has listed recommendations for construction of pollution abatement facilities in various parts of the United States.

The number of these projects totals 3,484 and the estimated cost is \$667,-000,000. A tabulation of the projects by area with their estimated cost is available through the office of the American Public Health Association, 50 West 50th Street, New York, N. Y.

JANUARY 1938 JOURNAL NEEDED

ASSOCIATION stock of the January, 1938, issue of the *American Journal of Public Health* is exhausted. The office will pay postage on any copies from members or subscribers. Address: American Public Health Association, 50 West 50th Street, New York, N. Y.

PUBLIC HEALTH COURSE FOR DENTISTS
COLUMBIA University School of Dentistry and Oral Surgery, during the current school year, is offering a course in public health for dentists.

This course, planned to provide dentists with essential training in public health, leads to a master of science degree.

PNEUMONIA SERUM FOR BALTIMORE INDIGENTS

INDIGENT hospital patients in the City of Baltimore have been supplied pneumonia serum, made possible by an appropriation to the Health Department.

Up to October 1, the Bureau of Laboratories of the Baltimore City Health Department distributed 5 million units of this serum at a cost of approximately \$2,000 among 11 hospitals for the treatment of 37 pneumonia patients. Among the 37 persons receiving the serum, there were 10 deaths and 27 recoveries.

SOUTHERN MEDICAL ASSOCIATION

AT the Southern Medical Association meeting, held in Oklahoma City recently, Arthur T. McCormack, M.D., of Louisville, Ky., immediate Past-President of the American Public Health Association, was elected President-elect of the Southern Medical Association; and Philip E. Blackerby, M.D., of Louisville, Ky., was elected Secretary-Treasurer.

STATE CONFERENCE ON PUBLIC HEALTH

AMONG the speakers scheduled to speak at the State Conference on Public Health, for Springfield, Ill., November 30 and December 1, were: Wilson G. Smillie, M.D., of New York, Harry S. Mustard, M.D., of New York, Adolph S. Rumreich, M.D., of Washington, Nels Nelson, M.D., of Massachusetts, Gaylord Anderson, M.D., of Minnesota, Arthur T. McCormack,

M.D., of Kentucky, Sophie Nelson of Boston, and C. C. Applewhite, M.D., of the U. S. Public Health Service, Chicago.

CHANGES IN NEW YORK STATE DEPARTMENT OF HEALTH

The following is a list of promotions and new assignments to the staff of the New York State Department of Health, which have been effected during October:

Ernest L. Stebbins, M.D.* Assistant Commissioner in Charge of Preventable Diseases.
 James E. Perkins, M.D., Dr.P.H.*—Director of Communicable Diseases.

Paul A. Lembecke, M.D.†—Epidemiologist in the Division of Communicable Diseases.

The following district officers have been appointed and their assignments are indicated:

Samuel Hyman, M.D.,† Utica
 Franklyn B. Amos, M.D.,† Amsterdam
 Harry L. Chant, M.D.,† Middletown
 Hollis S. Ingraham, M.D.,† Kingston
 Frank E. Coughlin, M.D.,* Albany, has become District State Health Director, with supervision over the Eastern New York State districts.

Robert L. Vought, M.D., Jamestown, Assistant District State Health Officer, has been placed in charge of the Jamestown sub-district office.

Gordon R. Gray, M.D., Batavia, Assistant District State Health Officer, has been placed in charge of the Batavia subdistrict office.

The following physicians have been appointed as Assistant District State Health Officers:

Wendell R. Ames, M.D.,† Lester Levingson, M.D.,† Bernard M. Blum, M.D.,† Walter C. Levy, M.D.,† John J. Bourke, M.D.,† Wilfred L. J. McDonald, M.D.,† James C. Boland, M.D.,† James J. Quinlivan, M.D.,† Simon J. Gormley, M.D., William M. Smith, M.D.,† Harvey S. Kinne, M.D.,† Ralph P. Vincent, M.D.

The following physicians have been appointed as Epidemiologist-in-training:

Robert Y. Gromet, M.D., Thistle McKee, M.D.

* Fellow A.P.H.A.

† Member A.P.H.A.

PERSONALS

Central States

CARL A. WILZBACH, M.D.,* has been appointed Health Commissioner of the City of Cincinnati, Ohio. Dr. Wilzbach has been the Director of Public Health Education of the Cincinnati Public Health Federation.

DR. JOHN ESSER, of Perham, Minn., has been appointed a member of the Minnesota State Board of Health, to succeed DR. SAMUEL Z. KERLAN, of Aitkin.

DR. ALBERT G. SCHULZE, of St. Paul, Minn., has been appointed a member of the Minnesota State Board of Health.

ANTONY TRIOLO, M.D.,† formerly of Philip, S. D., has been appointed Health Officer of Pennington County, succeeding DR. HORACE D. LIEN, of Rapid City, who has resigned to join the staff of the Fort Bidwell Hospital, Fort Bidwell, Calif.

Eastern States

FRANKLYN B. AMOS, M.D.,† has been appointed provisionally to the position of District Health Officer, in charge of the Amsterdam, N. Y., district, comprising Fulton and Montgomery Counties.

ALBERT E. AUSTIN, M.D.,* of Old Greenwich, Conn., former Health Officer of Greenwich, was elected to the House of Representatives as a Congressman in the November election.

DR. MARTHA WILSON MACDONALD, formerly in charge of the Children's Division of the Department of Psychiatry at Michael Reese Hospital, Chicago, Ill., has been appointed Director of a new child guidance clinic in New Orleans.

HELEN C. MANZER, PH.D.,† formerly Director of Nursing Education, New York University, is now Associate Professor of Education at the University.

HALSEY J. BALL, M.D.,* Health Officer of the Utica District, including Herkimer, Madison, and Oneida Counties, has retired from active service. He was associated with public health work from 1892.

HAROLD J. CONN, PH.D., Chief of the Department of Research in Soil Bacteriology in the New York Agricultural Experiment Station at Geneva, N. Y., has taken up special work at the Scripps Institution at the University of California, Berkeley, Calif., where he will study the growth of the soil bacteria in synthetic or prepared soils.

GORDON R. GRAY, M.D., C.P.H.,† of Amsterdam, N. Y., Assistant District Health Officer, is now in charge of the Batavia, New York, sub-district with jurisdiction over Orleans, Genesee, and Wyoming Counties.

RICHARD P. STRONG, M.D., for 25 years Professor and head of the Department of Tropical Medicine, Harvard Medical School, Boston, Mass., has retired from active teaching and has become Professor Emeritus.

Southern States

IRVIN ABELL, M.D., of Louisville, Ky., President of the American Medical Association, received, in a ceremony on November 5, the Laetare Medal of the University of Notre Dame, Notre Dame, Ind., awarded annually to an outstanding Catholic layman.

STEPHEN J. BEEKEN, M.D., for some months Assistant Health Officer for the Rockbridge County, Va., Health District, has been appointed Health Officer of the Russell-Tazewell Health District, with headquarters at Richlands.

DR. WILLARD W. GRIGGS has been appointed Health Officer of the Dicken-

* Fellow A.P.H.A.

† Member A.P.H.A.

son-Wise Health District, with headquarters at Norton, Va.

CLARENCE PORTER JONES, JR., M.D., has been appointed Assistant to ROBERT P. COOKE, M.D.,† of the Rockbridge County Health Department, Lexington, Va.

DR. GEORGE BOYCE LYNCH, of Brevard, N. C., has been appointed Health Officer of Transylvania County.

JOHN G. McNIEL, M.D., has been appointed Health Officer of the Montgomery County, Va., Health District, with headquarters at Christiansburg, Va. He succeeds WILLIAM M. FULLER, M.D.,† who is enrolled at the Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

ELLIS S. TISDALE, S.B.,† of Charleston, W. Va., for 22 years Sanitary Engineer in the West Virginia State Department of Health, has been granted an indefinite leave of absence to accept an appointment with the U. S. Public Health Service in connection with the stream pollution study of the Ohio River Basin. J. B. HARRINGTON, for several years Assistant Sanitary Engineer in West Virginia, has been named to succeed Mr. Tisdale as Director of the Sanitary Engineering Division.

HUNTINGTON WILLIAMS, M.D.,* has been reappointed Commissioner of Health of Baltimore, Md., for a term of 7 years.

L. L. WILLIAMS, M.D.,† Senior Surgeon, Malaria Investigations, U. S. Public Health Service, Washington, D. C., gave lectures on malaria at the University of North Carolina, Chapel Hill, N. C., October 31 and November 1.

MARK V. ZIEGLER, M.D.,† Senior Surgeon and Regional Consultant, U. S. Public Health Service, Washington, D. C., gave a lecture and showed a film on the work of the U. S. Public Health Service at the University of

North Carolina, Chapel Hill, N. C., November 8.

Western States

CHARLES L. COYLE, M.D.,† of Marshfield, Ore., has been appointed Health Officer of Coos County.

DR. FREDERICK SYDNEY HANSEN,† formerly of Pendleton, Ore., has been appointed Health Officer of Multnomah County.

ALFRED H. MACLAREN, M.D.,† formerly of Portland, Ore., has been appointed Health Officer of Umatilla County.

DR. PETER H. ROZENDAL † formerly of Lake Preston, S. D., has been appointed Health Officer of Klamath County, Ore.

Ecuador

HENRY HANSON, M.D.,* of Guayaquil, Ecuador, on the staff of the Pan American Sanitary Bureau, was recently decorated by the Ecuador Government with the Order of Merit, recognizing his services in connection with bubonic plague. Dr. Hanson was formerly State Health Officer of Florida.

DEATH

ELLA PHILLIPS CRANDALL, of New York, N. Y., died October 25. Miss Crandall became an instructor in public health nursing at Teachers College in 1910, and 2 years later, when the National Organization for Public Health Nursing was formed, became its first Executive Secretary. In 1920 she resigned from the N.O.P.H.N. and in 1921 became Director of a special committee to study community organization for health protection as worked out under the Association for Improving the Conditions of the Poor in New York City. At the time of her death Miss Crandall was Director of the Payne Fund, of New York.

* Fellow A.P.H.A.

† Member A.P.H.A.

INDEX

A

	Page
American Public Health Association:	
Governing Council. Constitution and By-Laws. Annual Meetings. Presidents of the A.P.H.A. Recognition for Extended Membership. Recipients of the Sedgwick Memorial Medal. Executive Staff. Editorial Board, <i>American Journal of Public Health</i> . Publications. Section Councils. Committee List, 1937-1938. Affiliated State Public Health Societies. Western Branch. Southern Branch.....	Year Book, 1-31
Abortion and the Public Health. Regine K. Stix, M.D., and Dorothy G. Wichl.....	621
Abramson, Harold, M.D., and Frant, Samuel, M.D. Epidemic Diarrhea of the New-Born. III, Epidemiology of Outbreaks of Highly Fatal Diarrhea Among New-Born Babies in Hospital Nurseries	36
Accident Statistics. Report of the Committee. Robert J. Vane, Chairman.....	Year Book, 160
Accuracy of the Cancer Death Records. Eleanor J. MacDonald.....	818
Achievements in Mental Hygiene and Promising Leads for Further Endeavor. C. M. Hincks, M.D.	251
Acidophilus and Dental Caries, Lactobacillus. Philip Jay, D.D.S.....	759
Acquired Tuberculosis in the Primate in Laboratories and Zoological Collections. C. R. Schroeder, D.V.M.	469
Acute Diarrheal Disorders, The. A. V. Hardy, M.D., Dr.P.H., and James Watt, M.D.....	730
Adaptation of the International List of Causes of Death to Changing Needs of the Medical Profession and Public Health Groups. Halbert L. Dunn, M.D., Ph.D.....	283
Administrative Control of Food Handlers and Places Dispensing Food and Drinks (Hartford, Conn.). Katherine Marden, Joseph M. Curry, D.V.S., Louis J. Horowitz, and Benjamin G. Horning, M.D.....	1277
Aedes aegypti. See Yellow Fever.	
Affiliated State Public Health Societies, American Public Health Association....	Year Book, 30
Agar Counts as Compared With Counts on Improved Agars at 32° C., Standard. M. W. Yale, Ph.D.	148
Age Adjustment of Death Rates. Report of the Committee on Forms and Methods of Statistical Practice. A. W. Hedrich, Sc.D., Chairman.....	Year Book, 164
Air. See Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia. Samuel R. Haythorn, M.D., and Harry B. Meller.....	470
Air, Alpha Hemolytic Streptococci of. Leon Buchbinder, Ph.D., Mathilde Solowey, and Morris Solotorovsky	61
Air Analysis. See Ventilation and Atmospheric Pollution.	
Air-Borne Infection. Editorial.....	195
Air-borne infection. See Measurement of Sanitary Ventilation. William Firth Wells and Mildred Weeks Wells.....	343
Air Conditioning, Sanitary Aspects of. C. P. Yaglou. (Correction, page 546).....	143
Airplane and Yellow Fever, The. Editorial.....	1116
Air Raids, The Fear of. Editorial.....	1334
Allocation of Deaths. Reprint of <i>Medical Officer</i> (London) comment on article by Elizabeth Parkhurst, Journal, July, 1937.....	27
Almazan, Dr. Leonides Andreu—Director of Public Health, Federal Department of Health, Mexico City, D. F. Statement for presentation at the Second General Session of the Sixty-seventh Annual Meeting in Kansas City, October 27, 1938.....	1358
Alpha Hemolytic Streptococci of Air: Their Variant Forms, Origin and Numbers per Cubic Foot of Air in Several Types of Locations. Leon Buchbinder, Ph.D., Mathilde Solowey, and Morris Solotorovsky.....	61
Alum Precipitated Toxoid for the Prevention of Diphtheria. Archibald S. Dean, M.D., Dr.P.H., and Samuel Hyman, M.D.....	1170
Amebiasis by Health Departments, A Suggested Program of Control of. Charles F. Craig, M.D.	187
Amebiasis. See The Acute Diarrheal Disorders. A. V. Hardy, M.D., Dr.P.H., and James Watt, M.D.	730
American Journal of Public Health. See Journal Policy. Editorial.....	198
American Museum of Health, An. Editorial.....	771
Ames, Miriam, R.N., Chairman. To Study Relationship Between Official and Nonofficial Public Health Nursing Agencies. Report of the Committee.....	Year Book, 157
Analyzing Frozen Desserts and Ingredients (Standard Methods). Reports of the Joint Standard Methods Committee. Food and Nutrition Chairman, J. H. Shrader, Ph.D., M.D.; Laboratory Chairman, Friend Lee Mickle, Sc.D.....	98
Anderson, Gaylord W., M.D. Scarlet Fever Immunization with Formalinized Toxin. A Preliminary Report	123
Anemia. See Handicaps in the Normal Growth and Development of Rural Negro Children. Hildrus A. Poindexter, M.D.....	1048
Angina Pectoris. See Contributions of Edward Jenner to Modern Concepts of Heart Disease. O. F. Hedley, M.D.....	1165

INDEX

	Page
Annual Meetings, Past—American Public Health Association.....	Year Book, 9
Antirabic Vaccination With Tissue Culture Virus, Experiments on. Leslie T. Webster, M.D.	44
Antirachitic Vitamin. See Present Status of Vitamin Milks. E. V. McCollum, Ph.D.....	1069
Antivivisection. See The So-Called Humane Pound Law in California. Editorial.....	510
Archivist, Report of the. The Laboratory Section of the American Public Health Association. Augustus B. Wadsworth, M.D.....	Year Book, 92
Arizona Public Health Association—New Affiliated Society, A.P.H.A.....	1443
Arnold, Lloyd, M.D. A Sanitary Study of Commercial Laundry Practices.....	839
Association Committees. See Year Book.	
Association News:	106, 225, 409, 543, 677, 796, 894, 1014, 1140, 1249, 1357, 1441
Affiliated Societies, New: Arizona Public Health Association, Colorado Public Health Association, Utah Public Health Association.....	1443
Sixty-Seventh Annual Meeting, American Public Health Association, Kansas City, Mo. (Headquarters: Hotels Muehlebach, President, and Kansas Citian):	
Association of Women in Public Health Plan All-Day Meeting for October 24..1021.	1253
Books at the Annual Meeting.....	1250
Headquarters	674
Hotel information etc.....	675, 996, 1141
Invitation from Chicago to Delegates en Route to Kansas City.....	1250
Kansas City Invites You.....	670
Kansas City Meeting, The (illustrated article).....	989
Kansas City Meeting, The.....	1140
Officers and Executive Committee.....	409
Our Sixty-Seventh Annual Meeting. Editorial.....	1420
Preliminary Program	965, 1251
Sixty-Seventh Annual Meeting, The. Editorial.....	1234
State Directors of Public Health Nursing.....	1253
Twentieth Annual Health Exhibit, The.....	1249
Almazan, Dr. Leonides Andreu—Director of Public Health, Federal Department of Health, Mexico City, D. F. Statement for presentation at the Second General Session of the Sixty-seventh Annual Meeting in Kansas City, October 27, 1938.....	1358
Applicants for Fellowship	1015, 1256
Applicants for Membership.....	107, 225, 410, 543, 677, 796, 895, 1017, 1143, 1254, 1359, 1443
Arizona Public Health Association—New Affiliated Society.....	1443
Closing Date for Submitting Applications for Fellowship.....	798-898, 1010
Colorado Public Health Association—New Affiliated Society.....	1443
Conference on the Hemolytic Streptococci.....	546
Corrected Identification of Mosquito in China Clipper.....	1362
Deceased Members	114, 412, 546, 680, 803, 897, 1018, 1258
(See Death Notices)	
Executive Board Meeting.....	106
Fellowship, Applicants for.....	1015, 1256
Fellowship, Closing Date for Submitting Applications for.....	798, 898, 1010
Frost, Wade Hampton, M.D.—Sedgwick Memorial Medal Awarded.....	1357
Governing Council, Nominations for the.....	1014
Health Conservation Contests.....	795, 894, 1252
Membership, Applicants for.....	107, 225, 410, 543, 677, 796, 895, 1017, 1143, 1254, 1359, 1443
Model Ordinances	414
New Members of A.P.H.A. Due to Western Branch Activities.....	1250
Nominations for the Governing Council.....	1014
Officers, 1938-1939	1357
Publications Needed	546, 680, 1362
Resolutions Passed at Kansas City, October, 1938.....	1441
Royal Sanitary Institute	227, 546
Sedgwick Memorial Medal Awarded Wade Hampton Frost, M.D.....	1357
Serodiagnostic Tests for Syphilis.....	1253
Skin Irritants Report Available.....	680
Standard Methods for the Examination of Dairy Products. Changes in New Edition. Robert S. Breed, Ph.D., Chairman of Committee.....	1447
Syphilis, Serodiagnostic Tests for.....	1253
Utah Public Health Association—New Affiliated Society.....	1443
Atmospheric Pollution, Committee on Ventilation and. See Ventilation.	
Auto Trailer, The. Editorial.....	961
Atwater, Reginald M., M.D., Dr.P.H. Managing Editor, American Journal of Public Health; also Chairman, Editorial Board.	
Atwater, Reginald M., M.D., Dr.P.H. National Health Conference [Washington, D. C., July 18-20, 1938]—A Review.....	1103

B

Babies in Hospital Nurseries, Epidemiology of Outbreaks of Highly Fatal Diarrhea Among New-Born. Epidemic Diarrhea of the New-Born. Samuel Frant, M.D., and Harold Abramson, M.D.	36
---	----

	Page
Bacteria Counts in Milk. See Standard Agar Counts as Compared With Counts on Improved Agars at 32° C. M. W. Yale, Ph.D.	148
Bacteria in the Air. See Alpha Hemolytic Streptococci of Air. Leon Buchblender, Ph.D., Mathilde Soloway, and Morris Solotorovsky	61
Bacteriological Examination of Dairy Products. Report on Examination of Dairy and Food Products (Standard Methods). Robert S. Reed, Ph.D., Chairman	102
Baird, R. D., M.D., and Rivers, Thomas M., M.D., Sc.D. Relation of Lymphocytic Chorionmeningitis to Acute Aseptic Meningitis (Wallgren)	47
Barrett, C. D., M.D., and Sears, Richard, M.D. The Epidemiology of Trichinosis	703
Barron, James Lloyd, C.E. Secretary, Public Health Engineering Section, A.P.H.A.	
Basic Principles of Healthful Housing. Preliminary Report of the Committee on the Hygiene of Housing. C. E. A. Winslow, Dr.P.H., Chairman	351
Bathing Places. Report of the Joint Committee. Warren J. Scott, Chairman	119
Bathing Places. See Chloramine Treatment of Sea Water. Lewis V. Carpenter, Lloyd R. Setter, and Morris Weinberg	923
Beard, Paul J., Ph.D., and Green, Carl E. Survival of E. Typhi in Sewage Treatment Plant Processes	762
Bellows, Marjorie T., Chairman. Death Certification. Report of the Committee	162
Berkson, Joseph, M.D. A Tabular Outline for Use in Reporting Hospital Morbidity	723
Bibliography. See Public Health Bibliography With Annotations, A Selected	
Billings, John Shaw—Born April 12, 1838. Editorial	1423
Biologic Products, Progress in and Present Status of. Report of the Committee. Elliott S. Robinson, M.D., Ph.D., Chairman	93
Biological Materials, An Inexpensive Method for the Dehydration and Preservation of Complement and Other. Enrique E. Ecker, Ph.D., and L. Pillemer, Ph.D.	1231
Biology of the Laboratory Animal. Report of the Standard Methods Committee. R. A. Kelsner, D.V.M., Chairman	101
Biophotometer Measurements. See The Dark Adaptation Test for Vitamin A Deficiency. Carroll E. Palmer, M.D.	309
Birth and Death Certificates in County Health Work, Value of the Vital Statistics Data on. Earle G. Brown, M.D.	1308
Birth and Death Certificates, Standard. Editorial	79
Bloomfield, J. J., Chairman. Report of Sub-Committee on Dust Procedures in Air Analysis: Review and Discussion of Methods of Analyzing Industrial Dusts	53
Bloomfield, J. J. Development of Industrial Hygiene in the United States	1388
Bolduan, Charles F., M.D. Diabetes—An Important Public Health Problem	21
Book Issue	April
Books and Reports:	
Adair, F. L., Editor. The Principles of Antepartum, Intrapartum and Postpartum Care for the Practitioner of Obstetrics	527
Adolescent, The. Ada Hart Arlitt	532
Adventures in Living Series: Now We Are Growing—Many Ways of Living—Keeping Fit—Blazing the Trail—How We Live. Thomas D. Wood, Anette M. Phelan, Marion O. Lerrigo, Nina B. Lamkin, and Thurman B. Rice	525
Adventures in Respiration. Yandell Henderson	529
Alexander, John, M.D., F.A.C.S. The Collapse Therapy of Pulmonary Tuberculosis	1009
Allergy: Its Practical Application. J. A. Rudolph, M.D.	1135
Altro Work Shops, Inc. Life and a Living. Committee for the Care of the Jewish Tuberculous	1127
American Foundations for Social Welfare. Russell Sage Foundation Library—Bertha F. Hulseman, Librarian	1352
American Foundrymen's Association. Good Housekeeping and Safety in Foundries	660
American Medicine: Expert Testimony Out of Court. By leading doctors and surgeons	528
American Municipal Association, Chicago. Milk Control: Governmental Regulation of the Dairy Industry in the United States	881
American Public Health Association. An Appraisal Form for Local Health Work	529
American Public Works Association. Public Works Engineers' Yearbook, 1938—Including Proceedings of the 1937 Public Works Congress, Atlanta, Ga., 1937	1131
American Red Cross: First Aid Textbook (rev. ed.)	217, 528
Swimming and Diving	1354
Anatomy and Physiology of Physical Training. Major R. W. Galloway	96
Anderson, John E., and Fagre, Marion L. Child Care and Training (4th ed.)	527
Annual Report of the Surgeon General, Public Health Service of the United States (Fiscal Year Ended June 30, 1937)	396
Apes, Men, and Morons. Earnest Albert Hooton	659
Appraisal Form for Local Health Work, An. American Public Health Association	529
Approved Laboratory Technique (2nd ed.). John Kolmer and Fred Boener	782
Arkin, Herbert, and Colton, Raymond R. Graphs: How To Make and Use Them	1243
Arlitt, Ada Hart. The Adolescent	532
Ashworth, Clarice M., and Osgood, Edwin E. Atlas of Hematology	526
Atlas of Hematology. Edwin E. Osgood and Clarice M. Ashworth	526
Atlas of Skeletal Maturation (Hand). T. Wingate Todd and Associates (1926-1936)	1130
Auerbach, Murray A. Programs for Local Tuberculosis Associations. Administrative Series No. 4	1005

INDEX

Books and Reports—Continued

	Page
Aughinbaugh, William E., M.D. I Swear by Apollo: A Life of Medical Adventure....	530
Averill, Lawrence A. Psychology Applied to Nursing.....	531
Baby's First Two Years, The (4th ed.). Richard M. Smith, M.D.....	215
Bacteriology: A Text-Book of Microörganisms (3rd ed.). Fred Wilbur Tanner.....	404
Bacteriological Atlas (2nd ed.). Richard Muir, enlarged and rewritten by C. E. van Rooyen	660
Bainbridge, Captain William Seaman. Report on Eighth International Congress of Military Medicine and Pharmacy.....	783
Bannen, J. E. The Radiology of Pulmonary Tuberculosis.....	1243
Bard, Philip, et al., Edited by. Macleod's Physiology in Modern Medicine (8th ed.)...	1346
Barnes, Laverne Almon, Ph.D. Robinson, Elliott Stirling, M.D., Ph.D., and White, Benjamin, Ph.D. The Biology of Pneumococcus.....	663
Bauer, W. W., M.D. Health, Hygiene and Hoocy.....	1434
Bauer, W. W., M.D., and Hull, Thomas G., Ph.D. Health Education of the Public: A Practical Manual of Technic.....	309
Bedford, T. Modern Principles of Ventilation and Heating.....	525
Bekuechle, B. E., Editor. Second Symposium on Silicosis.....	525
Benz, Francis E. Pasteur: Knight of the Laboratory.....	1348
Bergeim, Olaf, and Hawk, Philip B. Practical Physiological Chemistry (11th ed.)....	1230
Bigger, Joseph W., M.D. Handbook of Hygiene (5th ed.).....	218, 525
Biological Laboratory Technique: An Introduction to Research in Embryology, Cytology and Histology. J. Brontë Gatenby, Ph.D., D.Sc.....	661
Biology of Arteriosclerosis, The. M. C. Winternitz, M.D., R. M. Thomas, M.D., and P. M. Le Compte, M.D.....	1136
Biology of Pneumococcus, The. Benjamin White, Ph.D., with Elliott Stirling Robinson, M.D., Ph.D., and Laverne Almon Barnes, Ph.D.....	663
Board Members' Manual (2nd ed.). Prepared by the National Organization for Public Health Nursing	403
Bodansky, Meyer, M.D., Ph.D. Introduction to Physiological Chemistry (4th ed.)....	1132
Boener, Fred, and Kolner, John. Approved Laboratory Technique (2nd ed.).....	782
Bogert, L. Jean, and Porter, Mame T. Dietetics Simplified.....	524
Bolduan, Charles Frederiek, M.D., and Bolduan, Nils William, M.D. Public Health and Hygiene: A Students' Manual (2nd ed.).....	663
Bowes, Anna DePlanter, and Church, Charles F. Food Values of Portions Commonly Served	1135
Boyd, Julian D., M.D. Nutrition of the Infant and Child.....	1241
Bradbury, Samuel, M.D. The Cost of Adequate Medical Care.....	397
Brahdy, Leopold, and Kahn, Samuel, Editors. Trauma and Disease.....	528
Braude, Morris, M.D. The Principles and Practice of Clinical Psychiatry.....	662
Brief History of Nursing. Minnie Goodnow, R.N.....	529
Bromberg, Walter. The Mind of Man: The Story of Man's Conquest of Mental Illness..	528
Bronner, Augusta F., Ph.D., and Healy, William, M.D. New Light on Delinquency and Its Treatment	400
Brooks, Fowler D. Child Psychology.....	217
Brown, Esther Luelle. Nursing as a Profession.....	525
Bryan, Arthur H., V.M.D., and Bryan, Charles, M.D. Principles and Practice of Baeteriology	700
Buckstein, Jacob, M.D. Eat and Keep Fit.....	1136
Bulletin 342 (on the drug evil). Massachusetts Agricultural Experiment Station. Men- tioned in Editorial.....	1333
Bulletin of the Health Organisation of the League of Nations (August, 1937).....	1244
Bullowa, J. G. M. The Management of the Pneumonias.....	537
Burke, Richard M., M.D. A Historical Chronology of Tuberculosis.....	1436
Burrows, William, Revised by. A Textbook of General Bacteriology (12th ed.). Edwin O. Jordan	1348
Burt, Cyril, D.Sc. The Subnormal Mind (2nd ed.).....	1009
Butler, Charles S. Syphilis Sive Morbus Humanus: A Rationalization of Yaws So-Called	526
Butter Industry, Methods of Analysis for the. Edited by J. C. Fridenberg.....	889
Care of the Infant and the Young Child. Harry Lowenburg, Sr., M.D.....	532
Cause and Prevention of Disease. William Harvey Perkins, M.D.....	1346
Chambers, J. S., M.D. The Conquest of Cholera, America's Greatest Scourge.....	658
Champion, William M., Edited by. Medical Information for Social Workers.....	531
Chappel, Matthew N. In the Name of Common Sense: Worry and Its Control.....	1435
Chayer, Mary Ella, R.N. School Nursing: A Contribution to Health Education (2nd ed.)	221, 525
Chemical Analyses of Foods and Food Products, The. M. B. Jacobs.....	1239
Chemistry of Food and Nutrition (5th ed.). Henry C. Sherman.....	524
Chenoweth, Laurence B., M.D., and Machle, Willard, M.D. Foreword by Herman Schneider, Sc.D., LL.D. Industrial Hygiene—A Handbook of Hygiene and Toxicology for Engineers and Plant Managers.....	1435
Child Care and Training (4th ed.). Marion L. Faege and John E. Anderson.....	527
Child Guidance Procedures: Methods and Techniques Employed at the Institute for Juvenile Research. Institute for Juvenile Research (Chicago).....	1242
Child Psychology. Fowler D. Brooks.....	217
Childbirth Yesterday and Today. A. J. Rongy, M.D.....	98

Books and Reports—Continued	Page
Christian, Henry A., Revision by. Osler's Principles and Practice of Medicine (13th ed.)	1344
Church, Charles F., and Bowes, Anna DePlanter. Food Values of Portions Commonly Served	1135
Clay, Henry H. The Sanitary Inspector's Handbook: A Manual for Sanitary Inspectors and Other Executive Public Health Officers (3rd ed.)	1005
Cleanliness and Health. C. E. Turner, Dr.P.H., Sc.D., and Georgie B. Collins	885
Clinical Parasitology. Charles Franklin Craig and Ernest Carroll Faust	95, 526
Clinical Psychology: A Handbook of Children's Behavior Problems. C. M. Louttit	1006
Clough, Paul W., M.D., Clough, Mildred C., and Silt, E. R., M.D. Practical Bacteriology, Haematology and Animal Parasitology (9th ed.)	526, 528
Cobb, Walter Frank. Everyday First Aid	528
Collapse Therapy of Pulmonary Tuberculosis, The. John Alexander, M.D., F.A.C.S.	1009
Collins, Georgie B., and Turner, C. E., Dr.P.H., Sc.D.: Cleanliness and Health	885 885
Health	885
Collins, Selwyn D., and Tibbits, Clark. Research Memorandum on Social Aspects of Health in the Depression	101
Colnat, Albert. Les Epidemies et l'Histoire	1131
Colton, Raymond R., and Arkin, Herbert. Graphs: How To Make and Use Them	1243
Committee for the Care of the Jewish Tuberculous. Life and a Living (Altro Work Shops, Inc.)	1127
Compilation. American Medicine: Expert Testimony Out of Court	528
Complet Pediatrician, The: Practical, Diagnostic, Therapeutic and Preventive Pediatrics (2nd, rewritten ed.). Wilbur C. Davidson, M.D.	1003
Conquest of Cholera, America's Greatest Scourge, The. J. S. Chambers, M.D.	638
Cost of Adequate Medical Care, The. Samuel Bradbury, M.D.	397
Craig, Charles Franklin, and Faust, Ernest Carroll. Clinical Parasitology	95, 526
Craig, Gladys L., and Nelson, Nels A. Syphilis, Gonorrhea, and the Public Health	1240
Creative Re-education. Frederick Paterson	525
Crothers, Bronson, M.D. A Pediatrician in Search of Mental Hygiene	398
Currie, J. R., and Contributors. Manual of Public Health Laboratory Practice	526
Dafoc, Allan Roy. Guide Book for Mothers	527
Dairy Bacteriology (2nd ed.). B. W. Hammer, B.S., M.S., Ph.D.	884
Das Leben der Frau. Bruno Gebhard, M.D.	1353
Davenport, C. B., and Ekas, Merle P. Statistical Methods in Biology, Medicine, and Psychology (4th ed.)	527
Davidson, Wilbur C., M.D. The Complet Pediatrician: Practical, Diagnostic, Therapeutic and Preventive Pediatrics	1003
Davis, G. G., Salmonsens, E. M., and Earlywine, J. L. The Pneumonokonioses (Silicosis), Literature and Laws—Book III	220, 528
Davis, Michael M. Public Medical Services: A Survey of Tax-Supported Medical Care in the United States	213, 528
Deutseh, Albert. The Mentally Ill in America: A history of their care and treatment from Colonial times	527
Devil's Candle, The. Ruth DeForest Lamb	532
Diagnosis of Syphilis by the General Practitioner, The. (U. S. Public Health Service pamphlet). Joseph Earle Moore, M.D.	1244
Diet and High Blood Pressure. Dr. I. Harris	1004
Dietetics Simplified. L. Jean Bogert and Mame T. Porter	524
Dill, David Bruce. Life, Heat, and Altitude: Physiological Effects of Hot Climates and Great Heights	1238
Disease and the Man. Roger F. Lapham, A.B., M.D.	1129
Diseases of the Nervous System in Infancy, Childhood and Adolescence. Frank R. Ford, M.D.	401
Disinfection and Sterilization. Ernest C. McCulloch	526
Doctor and the Public, The. James Peter Warbasse	525
Dr. Nash's Cookery Book. Elwin H. T. Nash, M.R.C.S., M.R.C.P.	524, 533
Drinker, Cecil K., M.D. Not So Long Ago—A Chronicle of Medicine and Doctors in Colonial Philadelphia	665
Drug Evil, The. See Editorial mentioning Bulletin 342, published by Massachusetts Agricultural Experiment Station	1333
Dublin, Louis I., and Lotka, Alfred J. Twenty-five Years of Health Progress	535
Durfee, Helen Burr, and Hippler, C. W. Safe Living	1004
Dynamic Causes of Juvenile Crime. Nathaniel D. M. Hirsch, Ph.D.	1350
Eagle, Harry, M.D. Laboratory Diagnosis of Syphilis. Foreword by J. Earle Moore	527, 1349
Earlywine, J. L., Davis, G. G., and Salmonsens, E. M. The Pneumonokonioses (Silicosis) Literature and Laws of 1934—Book III	220, 528
Eat and Keep Fit. Jacob Buckstein, M.D.	1136
Ekas, Merle P., and Davenport, C. B. Statistical Methods in Biology, Medicine, and Psychology (4th ed.)	527
Emerson, Haven, M.D., and Fisher, Irving, LL.D. How To Live (20th ed.)	530, 1243
Environment and Its Effect Upon Man, The. Harvard School of Public Health	528
Ephraim, Jerome W. Take Care of Yourself: A Practical Guide to Health and Beauty	219
Epidemies et l'Histoire, Les. Albert Colnat	1131

Books and Reports—Continued

	Page
Esperimenti Di Vaccinazione Antituberculare. Laboratory of Comparative Pathology of the Royal University and Institute for Anti-tuberculous Vaccination of Milan.....	397
Essentials of Pathology. Lawrence W. Smith and Edwin S. Gault.....	529
Etiology of Trachoma. The. Louis A. Julianelle, Ph.D.....	532
von Eulenburg-Wiener, Renée. Fearfully and Wonderfully Made: The Human Organism in the Light of Modern Science.....	1351
Evans, Griffith. Latent Syphilis and the Autonomic Nervous System (2nd ed.).....	784
Everyday First Aid. Walter Frank Cobb.....	528
Exercise and Like It. Dudley B. Reed.....	529
Experimental Studies of Water Purification. Reprints of 5 Public Health Reports. H. W. Streeter, Frederick J. Moss, and C. T. Wright.....	782
Facts and Frauds in Woman's Hygiene. Rachel Lynn Palmer and Sarah K. Greenberg..	525
Faegre, Marion L., and Anderson, John E. Child Care and Training (4th ed.).....	527
Famliy in Health and in Illness, The. Florence Brown Sherbon, M.D.....	398
Father's Doing Nicely: The Expectant Father's Handbook. David Victor. Foreword by George W. Kosmak, M.D.....	1005
Faust, Ernest Carroll, and Craig, Charles Franklin. Clinical Parasitology.....	95, 526
Fearfully and Wonderfully Made: The Human Organism in the Light of Modern Science. Renée von Eulenburg-Wiener.....	1351
Federal and State Control of Milk Prices. James A. Tobey, Dr.P.H.....	102, 220
Feeding Behavior of Infants. Arnold Gesell and Frances L. Ilg.....	96
Ferrell, John A., and Meade, Pauline A. History of County Health Organizations in the United States, 1908-1933.....	527
Fifty Years a Country Doctor. William N. Macartney.....	529, 888
First Aid Textbook (rev. ed.). American Red Cross.....	217, 528
Fishbein, Morris, M.D.: Medical Writing: Its Art and Technie.....	531
Your Diet and Your Health.....	400
Fisher, Irving, LL.D., and Emerson, Haven, M.D. How to Live (20th ed.).....	530, 1243
Fit To Teach: A Study of the Health Problems of Teachers. 9th Year Book, National Education Association	885
Fluorine Intoxication: A Clinieal-Hygiene Study. Kaj Roholm.....	1008
Food Control: Public Health Aspects. James H. Shrader, Ph.D., D.P.H.....	530
Food Technology. Samuel C. Prescott and Bernard E. Proctor.....	525
Food Values of Portions Commonly Served. Anna DePlanter Bowes and Charles F. Church	1135
Ford, Frank R., M.D. Diseases of the Nervous System in Infancy, Childhood and Adolescence	401
Foundations of Nutrition, The (3rd ed.). Mary Swartz Rose.....	525, 883
Frederick, J. George: How To Be a Convincing Talker.....	784
Standard Business Etiquette.....	884
Fridenberg, J. C., Edited by. Methods of Analysis for the Butter Industry.....	889
Fundamentals of Internal Medicine. Wallace M. Yater.....	530
Furnas, C. C., and S. M. Man, Bread and Destiny.....	215, 524
Galdston, Iago, M.D. Maternal Deaths: The Ways to Prevention.....	401
Galloway, Major R. W. Anatomy and Physiology of Physical Training.....	96
Gantt, E. Horsley. Russian Medicine (Clio Medica).....	103
Gatenby, J. Brontë, Ph.D., D.Sc. Biological Laboratory Technique: An Introduction to Research in Embryology, Cytology and Histology.....	661
Gebhard, Bruno, M.D. Das Leben der Frau.....	1353
Gesell, Arnold, and Ilg, Frances L. Feeding Behavior of Infants.....	96
Getting Ready To Be a Mother (3rd ed.). Carolyn Conant Van Blarcom, R.N.....	534
Gibbens, Dr. John. Posture and Exercise for Young Children.....	1434
Gogle, Gladys B. A Workbook in Health for High School Girls.....	662
Gogle, Gladys B. A Workbook in Health for High School Girls.....	530, 1240
Goldberg, Jacob A., and Long, W. Bayard, M.D. Handbook on Social Hygiene.....	530, 1240
Goldberg, Jacob A., and Long, W. Bayard, M.D. Handbook on Social Hygiene.....	530, 1240
Gonzales, Thomas A., M.D., Vanece, Morgan, M.D., and Helpfern, Milton, M.D. Legal Medicine and Toxicology	658
Good Housekeeping and Safety in Foundries. American Foundrymen's Association.....	660
Goodnow, Minnie, R.N. Brief History of Nursing.....	529
Goodnow, Minnie, R.N. Brief History of Nursing.....	1213
Graphs: How To Make and Use Them. Herbert Arkin and Raymond R. Colton.....	526
Graybeal, Elizabeth. The Measurement of Outcomes of Physical Education for College Women	216, 526
Greenberg, Sarah K., and Palmer, Rachel Lynn. Facts and Frauds in Woman's Hygiene	525
Gruenberg, Benjamin C., and Unzieker, Samuel P. Science in Our Lives.....	1423
Guide Book for Mothers. Allan Roy Daboe.....	527
Hackett, L. W. Malaria in Enrope.....	57, 526
Hahn, Mary L., and Winslow, Charles-Edward Amory, Dr.P.H. Let's Grow and Let's Stay Well	884
Hammer, B. W., B.S., M.S., Ph.D. Dairy Bacteriology (2nd ed.).....	884
Hammer, B. W., B.S., M.S., Ph.D. Dairy Bacteriology (2nd ed.).....	401
Handbook of Accepted Remedies. A (2nd ed.). Edited by P. J. Hanzlik, M.D.....	791
Handbook of Chemistry (2nd ed.). Dr. N. A. Lange.....	525
Handbook of Hygiene (5th ed.). Joseph W. Bigger, M.D.....	218, 525
Handbook of Microscopical Technique (2nd ed.). C. E. McClung.....	525

	Page
Books and Reports—Continued	
Handbook on Social Hygiene. W. Bayard Long, M.D., and Jacob A. Goldberg.....	530, 1210
Hanzlik, P. J., M.D. A Handbook of Accepted Remedies (2nd ed.).....	401
Hardenbergh, W. A. Sewerage and Sewage Treatment.....	1245
Harris, Dr. I. Diet and High Blood Pressure.....	1004
Harris, Leslie J. Vitamins—In Theory and Practice (2nd ed.).....	524
Hart, Joseph K., Ph.D. An Introduction to the Social Studies.....	102
Harvard School of Public Health. The Environment and Its Effect Upon Man.....	528
Hawk, Philip B., and Bergeim, Olaf. Practical Physiological Chemistry (11th ed.)....	1239
Health. C. E. Turner, Dr.P.H., Sc.D., and Georgie B. Collins.....	885
Health and a Day. Lord Horder, M.D.....	530
Health Education of the Public: A Practical Manual of Technique. W. W. Bauer, M.D., and Thomas G. Hull, Ph.D.....	309
Health Education Workbook. A. Kathleen Wilkinson Wootten.....	527
Health, Hygiene and Hoocy. W. W. Bauer, M.D.....	1434
Health Section Report, World Federation of Education Associations: Seventh Biennial Conference, Tokyo, Japan, August, 1937.....	882
Healy, William, M.D., and Brouner, Augusta F., Ph.D. New Light on Delinquency and Its Treatment	400
Heffron, Roderick, M.D. Pneumonia: With Special Reference to Pneumococcus Lobar Pneumonia	531
Heffron, Roderick, M.D., and Lord, Frederick T., M.D. Pneumonia and Serum Therapy..	1132
Helpen, Milton, M.D., Gonzales, Thomas A., M.D., and Vanee, Morgan, M.D. Legal Medicine and Toxicology	658
Henderson, Yandell. Adventures in Respiration.....	529
Hill, A. Bradford, D.Sc., Ph.D. Principles of Medical Statistics.....	663
Hippler, C. W., and Durfee, Helen Burr. Safe Living.....	1004
Hirsch, Nathaniel D. M., Ph.D. Dynamic Causes of Juvenile Crime.....	1350
Hiscock, Ira V., and Others. Ways to Community Health.....	532
Historical Chronology of Tuberculosis, A. Richard M. Burke, M.D.....	1436
History of County Health Organizations in the United States, 1908-1933. John A. Ferrell and Pauline A. Meade.....	527
Holecomb, Richmond C. Who Gave the World Syphilis?—The Haitian Myth.....	527
Holsendorf, B. E. The Rat and Ratproof Construction of Buildings. Supplement No. 131, Public Health Reports.....	750
Hooton, Earnest Albert. Apes, Men, and Morons.....	659
Hopkins, L. Thomas, and Kinyon, Kate W.: Junior Clothing (rev. ed.).....	99
Junior Foods (rev. ed.).....	99
Hopkins, L. Thomas, and Others. Integration, Its Meaning and Application.....	755
Horder, Lord, M.D. Health and a Day.....	530
Hospital Head Nurse, The. Mary Marvin Wayland, A.M., R.N.....	1433
How To Be a Convincing Talker. J. George Frederick.....	784
How To Live (20th ed.). Irving Fisher, LL.D., and Haven Emerson, M.D.....	530, 1243
How To Use Pictorial Statistics. Rudolph Modley.....	785
Hull, Thomas G., Ph.D., and Bauer, W. W., M.D. Health Education of the Public: A Practical Manual of Technique.....	309
Hulseman, Bertha F., Librarian: Russell Sage Foundation Library. American Founda- tions for Social Welfare	1352
Hurlöck, Elizabeth B., Ph.D. Modern Ways With Babies.....	1129
Hussey, Marguerite M., Ph.D. Teaching for Health.....	1128
I Swear by Apollo: A Life of Medical Adventure. William E. Anghinbaugh, M.D.....	530
Ig, Frances L., and Gesell, Arnold. Feeding Behavior of Infants.....	96
In the Name of Common Sense: Worry and Its Control. Matthew N. Chappel.....	1435
Industrial Hygiene—A Handbook of Hygiene and Toxicology for Engineers and Plant Managers. Laurence B. Chenoweth, M.D., and Willard Maehle, M.D., with Foreword by Herman Schneider, Sc.D., LL.D.....	1435
Institute for Juvenile Research (Chicago). Child Guidance Procedures: Methods and Techniques Employed at the Institute for Juvenile Research.....	1242
Institute for Research Devoted to Vocational Guidance. Sanitary Engineering as a Career: A Monograph (from "Careers").....	1135
Integration, Its Meaning and Application. L. Thomas Hopkins and Others.....	785
Intensive Rural Hygiene Work in Netherlands India. Public Health Service of Netherlands	885
International Association of Milk Sanitarians. Journal of Milk Technology.....	1006
Introduction to Medical Statistics. An. Hilda M. Woods and William T. Russell.....	1436
Introduction to Physiological Chemistry (4th ed.). Meyer Bodansky, M.D., Ph.D.....	1132
Introduction to the Social Studies, An. Joseph K. Hart, Ph.D.....	102
Isaacs, Susan. The Nursery Years.....	1134
Jacobs, M. B. The Chemical Analyses of Foods and Food Products.....	1239
Jameson, W. W., and Parkinson, G. S. A Synopsis of Hygiene (5th ed.).....	525
Jordan, Edwin O. A Textbook of General Bacteriology (12th ed.). Revised by William Burrows	1348
Journal of Milk Technology. International Association of Milk Sanitarians.....	1006
Julianelle, Louis A., Ph.D. The Etiology of Trachoma.....	532
Junior Clothing (rev. ed.). Kate W. Kinyon and L. Thomas Hopkins.....	99

Books and Reports—Continued

	Page
Junior Foods (rev. ed.). Kate W. Kinyon and L. Thomas Hopkins.....	99
Jurispudence for Nurses: Legal Knowledge Bearing Upon Acts and Relationships Involved in the Practice of Nursing (2nd ed.). Carl Scheffel, M.D., and Eleanor McGavrah, R.N.	1245
Kahu, Samuel, and Brady, Leopold, Editors. Trauma and Disease.....	528
Klug, Clarence. Social Agency Boards and How To Make Them Effective.....	1351
Kinyon, Kate W., and Hopkins, L. Thomas:	
Junior Clothing (rev. ed.).....	99
Junior Foods (rev. ed.).....	99
Kistler, John B., M.D., and Smith, Kenneth D., M.D. Occupational Diseases in Ohio: Annual Report for 1937.....	1343
Kolmer, John, and Boemer, Fred. Approved Laboratory Technique (2nd ed.).....	782
Krumhaar, E. B., M.D. Pathology (Clio Medica).....	215, 526
Kuehle, B. E., Edited by. Third Symposium on Silicosis (Saranac Lake).....	788
Kurtz, Russell H., Edited by. The Public Assistance Worker.....	1238
Laboratory Diagnosis of Syphilis. Harry Eagle, M.D. Foreword by J. Earle Moore.....	527, 1349
Laboratory Handbook for Dietetics, A. (4th ed.). Mary Swartz Rose.....	524
Lamb, Ruth DeForest. The Devil's Candle.....	532
Lange, Dr. N. A. Handbook of Chemistry (2nd ed.).....	791
Lapham, Roger F., A.B., M.D. Disease and the Man.....	1129
Last Thirty Years in Public Health, The: Recollections and Reflections on My Official and Post-Official Life. Sir Arthur Newsholme.....	527
Latent Syphilis and the Autonomic Nervous System (2nd ed.). Griffith Evans.....	784
League of Nations, Bulletin of the Health Organisation of the (August, 1937).....	1244
League of Nations. Nutrition: Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy..	403
Leben der Frau, Das. Bruno Gebhard, M.D.....	1353
LeCompte, P. M., M.D., Winternitz, M. C., M.D., and Thomas, R. M., M.D. The Biology of Arteriosclerosis	1136
Lectures on the Control of Syphilis and Other Infectious Diseases. Thorvald Madsen, M.D.	880
Legal Medicine and Toxicology. Thomas A. Gonzales, M.D., Morgan Vance, M.D., and Milton Helpern, M.D.	638
Les Epidemies et l'Histoire. Albert Colnat.....	1131
Les Microbes Anaerobes. M. Weinberg, R. Nativelle, and A. R. Prevot.....	534
Let's Grow and Let's Stay Well. Mary L. Hahn and Charles-Edward Auery Winslow, Dr.P.H.	884
Let's Help the Doctor. Margaret O'Donovan Rossa, R.N.....	1004
Life and a Living (Altro Work Shops, Inc.). Committee for the Care of the Jewish Tuberculous	1127
Life and Death: The Autobiography of a Surgeon. Andrea Majocchi.....	527
Life, Heat, and Altitude: Physiological Effects of Hot Climates and Great Heights. David Bruce Dill	1238
Long, W. Bayard, M.D., and Goldberg, Jacob A. Handbook on Social Hygiene.....	530, 1240
Lord, Frederick T., M.D., and Hefron, Roderick, M.D. Pneumonia and Serum Therapy..	1132
Lotka, Alfred J., and Dublin, Louis I. Twenty-five Years of Health Progress.....	535
Louttit, C. M. Clinical Psychology: A Handbook of Children's Behavior Problems....	1006
Lowenhiel, Harry, Sr., M.D. Care of the Infant and the Young Child.....	532
Ludoviel, Anthony M. The Truth About Childbirth.....	532
Macartney, William N. Fifty Years a Country Doctor.....	529, 888
Machle, Willard, M.D., and Chewoweth, Laurence B., M.D. Foreword by Herman Schneider, Se.D., LL.D. Industrial Hygiene—A Handbook of Hygiene and Toxic- ology for Engineers and Plant Managers.....	1435
Macleod's Physiology in Modern Medicine (5th ed.). Edited by Philip Bard et al.....	1346
Madsen, Thorvald, M.D. Lectures on the Control of Syphilis and Other Infectious Diseases	880
Magner, William, M.D., D.P.H. A Textbook of Hematology.....	1002
Majocchi, Andrea:	
Life and Death: The Autobiography of a Surgeon.....	527
More of My Life.....	1007
Malaria in Europe. L. W. Hackett.....	97, 526
Man, Bread and Destiny. C. C. Furnas and S. M. Furuus.....	215, 524
Man in a Chemical World. A. Cressy Morrison.....	526
Management of the Pneumonias, The. J. G. M. Bullowa.....	537
Manual for Water Works Operators. Edited by E. W. Steel for the Texas Water Works Short School	1002
Manual of Public Health Laboratory Practice. J. R. Currie and Contributors.....	526
"Marihuana"—The New Dangerous Drug. Frederick T. Merrill.....	1133
Massachusetts Agricultural Experiment Station Bulletin 342 (on The Drug Evil). Mentioned in Editorial	1333
Maternal Deaths: The Ways to Prevention. Iago Galdston, M.D.....	401
McClung, C. E. Handbook of Microscopical Technique (2nd ed.).....	526
McCulloch, Ernest C. Disinfection and Sterilization.....	523

Books and Reports—Continued

	Page
McGarvrah, Eleanor, R.N., and Scheffel, Carl, M.D. Jurisprudence for Nurses: Legal Knowledge Bearing Upon Acts and Relationships Involved in the Practice of Nursing (2nd ed.)	1245
McNally, William D., A.B., M.D. Toxicology	664
Meade, Pauline A., and Ferrell, John A. History of County Health Organizations in the United States, 1908-1933	527
Measurement of Outcomes of Physical Education for College Women. The. Elizabeth Graybeal	216, 526
Medical Information for Social Workers. Edited by William M. Champion, M.D.	531
Medical Writing: Its Art and Technique. Morris Fishbein, M.D.	531
Mental Hygiene for Nurses. Elizabeth Lee Vincent	531, 1130
Mentally Ill in America, The: A History of their care and treatment from Colonial times. Albert Deutsch	527
Merrill, Frederick T. "Marihuana"—The New Dangerous Drug	1133
Methods of Analysis for the Butter Industry. Edited by J. C. Fridenberg	889
Microbes Anaerobies, Les. M. Weinberg, R. Nativelle, and A. R. Prevot	534
Milan: Esperimenti Di Vaccinazione Antitubercolare. Laboratory of Comparative Pathology of the Royal University and Institute for Anti-tuberculous Vaccination of Milan	397
Milestones in Medicine. Introduction by James Alexander Miller, M.D.	664
Milk Control: Governmental Regulation of the Dairy Industry in the United States. American Municipal Association, Chicago	881
Miller, James Alexander, M.D., Introduction by. Milestones in Medicine	664
Mind of Man, The: The Story of Man's Conquest of Mental Illness. Walter Bromberg	528
Minneapolis, Report of Investigations of the Typhoid Fever Epidemic, 1935. Minnesota Department of Health	783
Modern Principles of Ventilation and Heating. T. Bedford	525
Modern Ways With Babies. Elizabeth B. Hurlock, Ph.D.	1129
Modley, Rudolph. How To Use Pictorial Statistics	785
Moore, Joseph Earle, M.D. The Diagnosis of Syphilis by the General Practitioner (U. S. Public Health Service pamphlet)	1244
More of My Life. Andrea Majocchi	1007
Morell, Peter. Poisons, Potions and Profits: The Antidote to Radio Advertising	661
Morgan, John J. B. The Psychology of Abnormal People (rev. ed.)	528, 1003
Morrison, A. Cressy. Man in a Chemical World	526
Morton, Rosalie Slaughter. A Woman Surgeon	527
Muir, Richard—enlarged and rewritten by C. E. van Rooyen. Bacteriological Atlas (2nd ed.)	660
Myers, J. Arthur, Ph.D., M.D. Tuberculosis Among Children and Young Adults (2nd ed.)	886
Nash, Elwin H. T., M.R.C.S., M.R.C.P. Dr. Nash's Cookery Book	524, 538
National Education Association—9th Year Book. Fit To Teach: A Study of the Health Problems of Teachers	885
National Health Survey: Preliminary Reports	533
National Organization for Public Health Nursing. Board Members' Manual (2nd ed.)	403
National Society for the Prevention of Blindness, Proceedings of the 1936 Annual Conference of the	217
Nativelle, R., Prevot, A. R., and Weinberg, M. Les Microbes Anaerobies	534
Nelson, Nels A., and Crain, Gladys L. Syphilis, Gonorrhea, and the Public Health	1240
Netherlands, Public Health Service of. Intensive Rural Hygiene Work in Netherlands India	885
New Light on Delinquency and Its Treatment. William Healy, M.D., and Augusta F. Bronner, Ph.D.	400
Newsholme, Sir Arthur. The Last Thirty Years in Public Health: Recollections and Reflections on My Official and Post-Official Life	527
Northwestern University Medical School, Chicago. Occupational Disease Symposium	1127
Not So Long Ago—A Chronicle of Medicine and Doctors in Colonial Philadelphia. Cecil K. Drinker, M.D.	665
Noyes, Arthur P., M.D. Textbook of Psychiatry (2nd ed.)	528
Nursery Years, The. Susan Isaacs	1134
Nursing as a Profession. Esther Lucile Brown	525
Nutrition: Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy	403
Nutrition of the Infant and Child. Julian D. Boyd, M.D.	1241
Occupational Disease Symposium. Northwestern University Medical School, Chicago	1127
Occupational Diseases in Ohio: Annual Report for 1937. Kenneth D. Smith, M.D., and John B. Kistler, M.D.	1343
Orton, Samuel Torrey, M.D. Reading, Writing and Speech Problems in Children	661
Osgood, Edwin E., and Ashworth, Clarice M. Atlas of Hematology	526
Osler's Principles and Practice of Medicine (13th ed.). Revision by Henry A. Christian, M.D., LL.D.	1344
Palmer, Rachel Lynn, and Greenberg, Sarah K. Facts and Frauds in Woman's Hygiene	525
Parkinson, G. S., and Jameson, W. W. A Synopsis of Hygiene (5th ed.)	525
Parran, Thomas. Shadow on the Land—"Syphilis."	526

Books and Reports—Continued

Pasteur: Knight of the Laboratory. Francis E. Benz.....	Page 1348
Paterson, Frederick. Creative Re-education.....	525
Pathology (Ohio Medical). E. B. Krumbhaar, M.D.....	215, 526
Pediatrician in Search of Mental Hygiene, A. Bronson Crothers, M.D.....	398
PEP, Health Group of (London). Report on the British Health Services.....	786, 1016
Perkins, William Harvey, M.D. Cause and Prevention of Disease.....	1346
Personal Hygiene. C. E. Turner.....	525
Personnel Policies in Public Health Nursing. Marian G. Randall.....	889
Phenomenon of Local Tissue Reactivity and Its Immunological, Pathological and Clinical Significance. Gregory Shwartzman	213, 526
Physicians' Vitamin Reference Book. E. R. Squibb & Sons.....	1133
Physiology in Modern Medicine—Macleod's (8th ed.). Edited by Phillip Bard, et al.....	1346
Pneumonia: With Special Reference to Pneumococcus Lobar Pneumonia. Roderick Heffron, M.D.	551
Pneumonia and Serum Therapy. Frederick T. Lord, M.D., and Roderick Heffron, M.D..	1132
Pneumokoniosis, The (Silicosis). Literature and Laws—Book III. G. G. Davis, E. M. Salmonsens, and J. L. Earlywine.....	229, 528
Poisons, Potions and Profits: The Antidote to Radio Advertising. Peter Morell.....	661
Porter, Name T., and Bogert, L. Jean. Dietetics Simplified.....	521
Posture and Exercise for Young Children. Dr. John Gibbens.....	1434
Practical Bacteriology, Haematology and Animal Parasitology (9th ed.). E. R. Stitt, M.D., Paul W. Clough, M.D., and Mildred C. Clough.....	526, 538
Practical Medical Dictionary, A (13th ed.). Thomas Lathrop Steadman.....	528
Practical Physiological Chemistry (11th ed.). Philip B. Hawk and Olaf Bergelin.....	1239
Prescott, Samuel C., and Proctor, Bernard E. Food Technology.....	525
Prevot, A. R., Weinberg, M., and Nativelle, R. Les Microbes Anaerobies.....	534
Principles and Practice of Bacteriology. Arthur H. Bryan, V.M.D., and Charles Bryan, M.D.	700
Principles and Practice of Clinical Psychiatry. The. Morris Brande, M.D.....	662
Principles and Practice of Medicine—Osler's (13th ed.). Revision by Henry A. Christian, M.D., LL.D.	1314
Principles and Practice of Public Health Dentistry. J. A. Salzmann, D.D.S..	100, 528
Principles of Antepartum, Intrapartum and Postpartum Care for the Practitioner of Obstetrics, The. F. L. Adair, Editor.....	527
Principles of Medical Statistics. A. Bradford Hill, D.Sc., Ph.D.....	663
Proceedings of the 1936 Annual Conference of the National Society for the Prevention of Blindness	217
Proctor, Bernard E., and Prescott, Samuel C. Food Technology.....	525
Programs for Local Tuberculosis Associations. Administrative Series No. 4. Murray A. Auerbach	1005
Psychology Applied to Nursing. Lawrence A. Averill.....	531
Psychology of Abnormal People. The (3rd ed.). John J. B. Morgan.....	528
Psychology of Eating, The. Lewis R. Wolberg, M.D.....	537
Psychology of the Unadjusted School Child, The (rev. ed.). John J. B. Morgan.....	1003
Public Assistance Worker, The. Edited by Russell H. Kurtz.....	1239
Public Health and Hygiene: A Students' Manual (2nd ed.). Charles Frederick Bolduan, M.D., and Nils William Bolduan, M.D.....	665
Public Health and Medical Licensure in the State of Mississippi, 1798-1937. Felix J. Underwood, M.D., and R. N. Whitfield, M.D.....	1432
Public Health Committee of the Cup and Container Institute. Techniques for the Bacteriological Examination of Drinking Glasses.....	1345
Public Medical Services: A Survey of Tax-Supported Medical Care in the United States. Michael M. Davis.....	213, 528
Public Works Engineers' Yearbook, 1938—Including Proceedings of the 1937 Public Works Congress, Atlanta, Ga., 1937. American Public Works Association.....	1131
Pulmonary Tuberculosis in Practice. R. C. Whigfield.....	887
Radiology of Pulmonary Tuberculosis, The. J. E. Bannen.....	1243
Randall, Marian G. Personnel Policies in Public Health Nursing.....	889
Rat and Ratproof Construction of Buildings, The. Supplement No. 131, Public Health Reports. B. E. Holsendorf	749
Reading, Writing and Speech Problems in Children. Samuel Torrey Orton, M.D.....	661
Reed, Dudley B. Exercise and Lake It.....	529
Report of Investigations of the Typhoid Fever Epidemic, Minneapolis, Minn., 1925. Minnesota Department of Health.....	782
Report on Eighth International Congress of Military Medicine and Pharmacy. Captain William Seaman Bainbridge	743
Report on the British Health Services. Health Group of PEP (London).....	7-8, 1016
Research Memorandum on Crime During the Depression. Thorsten Sellin.....	161
Research Memorandum on Social Aspects of Health in the Depression. Selwyn D. Collins and Clark Tibbitts.....	161
Robinson, Elliott Stirling, M.D., Ph.D., Barnes, Laverne Almon, Ph.D., and White, Benjamin, Ph.D. The Biology of Pneumococcus.....	627
Roholm, Kaj. Fluorine Intoxication: A Clinical-Hygienic Study.....	1005
Rongy, A. J., M.D.: Childbirth Yesterday and Today	53
Safety Through Childbirth	58

Books and Reports—Continued	Page
Rood, Elma. Tuberculosis Education: A Guide for Professional and Lay Workers....	525
Rose, Mary Swartz:	
Foundations of Nutrition, The (3rd ed.).....	525, 883
Laboratory Handbook for Dietetics, A (4th ed.).....	524
Rossa, Margaret O'Donovan, R.N. Let's Help the Doctor.....	1004
Rudolph, J. A., M.D. Allergy: Its Practical Application.....	1135
Russell Sage Foundation Library—Bertha F. Hulseman, Librarian. American Founda- tions for Social Welfare.....	1352
Russell, William T., and Woods, Hilda M. An Introduction to Medical Statistics.....	1436
Russian Medicine (Clio Medica). E. Horsley Gault.....	103
Safe Living. C. W. Hippler and Helen Burr Durfee.....	1004
Safety Through Childbirth. A. J. Rougy, M.D.....	98
Salmonsén, E. M., Earlywine, J. L., and Davis, G. G. The Pneumonokonioses (Silicosis) Literature and Laws of 1934—Book III.....	220, 528
Salzmann, J. A., D.D.S. Principles and Practice of Public Health Dentistry.....	100, 528
Sanitary Engineering as a Career: A Monograph (from "Careers"). The Institute for Research Devoted to Vocational Guidance.....	1135
Sanitary Inspector's Handbook, The: A Manual for Sanitary Inspectors and Other Executive Public Health Officers (3rd ed.). Henry H. Clay.....	1005
Scheffel, Carl, M.D., and McGarrah, Eleanor, R.N. Jurisprudence for Nurses: Legal Knowledge Bearing Upon Acts and Relationships Involved in the Practice of Nursing (2nd ed.)	1245
School Nursing: A Contribution To Health Education (2nd ed.). Mary Ella Chayer, R.N.	221, 525
Science in Our Lives. Benjamin C. Gruenberg and Samuel P. Unzicker.....	1433
Second Symposium on Silicosis. B. E. Beknechle, Editor.....	525
Sellin, Thorsten. Research Memorandum on Crime During the Depression.....	101
Sewerage and Sewage Treatment. W. A. Hardenbergh.....	1245
Shadow on the Land—"Syphilis." Thomas Parran.....	526
Sherbon, Florence Brown, M.D. The Family in Health and in Illness.....	398
Sherman, Henry C. Chemistry of Food and Nutrition (5th ed.).....	524
Shrader, James H., Ph.D., D.P.H. Food Control: Public Health Aspects.....	530
Shwartzman, Gregory. Phenomenon of Local Tissue Reactivity and Its Immunological, Pathological and Clinical Significance.....	213, 526
Sigerist, Prof. Henry E., M.D. Socialized Medicine in the Soviet Union.....	219
Silicosis, Second Symposium on. B. E. Beknechle, Editor.....	525
Silicosis, Third Symposium on (Saranae Lake). Edited by B. E. Knechle.....	788
Smith, Kenneth D., M.D., and Kistler, John B., M.D. Occupational Diseases in Ohio: Annual Report for 1937	1343
Smith, Lawrence W., and Gault, Edwin S. Essentials of Pathology.....	529
Smith, Richard M., M.D. The Baby's First Two Years (4th ed.).....	215
Social Agency Boards and How To Make Them Effective. Clarence King.....	1351
Socialized Medicine in the Soviet Union. Prof. Henry E. Sigerist, M.D.....	219
Solomon, Charles. The Traffic in Health.....	528
Some Fundamental Aspects of the Cancer Problem. Edited by Henry B. Ward.....	96, 527
Spies, Tom D., M.D., and Williams, Robert R., Sc.D. Vitamin B ₁ (Thiamin) and Its Use in Medicine	1314
Squibb, E. R., & Sons. Physicians' Vitamin Reference Book.....	1133
Standard Business Etiquette. J. George Frederick.....	884
Statistical Methods in Biology, Medicine, and Psychology (4th ed.). C. B. Davenport and Merle P. Ekas	527
Stedman, Thomas Lathrop. A Practical Medical Dictionary (13th ed.).....	528
Steel, E. W. Water Supply and Sewerage.....	532
Steel, E. W., Edited by—for the Texas Water Works Short School. Manual for Water Works Operators	1002
Step by Step in Sex Education. Edith Hale Swift, M.D.....	1008
Stitt, E. R., M.D., Clough, Paul W., M.D., and Clough, Mildred C. Practical Bac- teriology, Haematology and Animal Parasitology (9th ed.).....	526, 538
Streeter, H. W., Moss, Frederick J., and Wright, C. T. Experimental Studies of Water Purification. Reprints of 5 Public Health Reports.....	782
Subnormal Mind, The (2nd ed.). Cyril Burt, D.Sc.....	1009
Successful Living. W. Béran Wolfe.....	1353
Surgeon General, Public Health Service of the United States—Annual Report, Fiscal Year Ended June 30, 1937.....	396
Swift, Edith Hale, M.D. Step by Step in Sex Education.....	1008
Swimming and Diving. American Red Cross.....	1354
Synopsis of Hygiene, A. (5th ed.) W. W. Jameson and G. S. Parkinson.....	525
Syphilis and Other Infectious Diseases, Lectures on the Control of. Thorvald Madsen, M.D.	880
Syphilis, Gonorrhea, and the Public Health. Nels A. Nelson and Gladys L. Crain.....	1240
Syphilis Sive Morbus Humanus: A Rationalization of Yaws So-Called. Charles S. Butler	526
Take Care of Yourself: A Practical Guide to Health and Beauty. Jerome W. Ephraim..	219
Tanner, Fred Wilbur. Bacteriology: A Text-Book of Microorganisms (3rd ed.).....	404
Teaching for Health. Marguerite M. Hussey, Ph.D.....	1128

Books and Reports—Continued

	Page
Technics for the Bacteriological Examination of Drinking Glasses. Public Health Committee of the Cup and Container Institute.....	1345
Texas Water Works Short School. Edited by E. W. Steel. Manual for Water Works Operators	1002
Textbook of General Bacteriology, A (12th ed.). Edwin O. Jordan. Revised by William Burrows	1348
Textbook of Hematology, A. William Magner, M.D., D.P.H.	1002
Textbook of Psychiatry (2nd ed.). Arthur P. Noyes, M.D.	99, 528
Third Symposium on Silicosis (Saranac Lake). Edited by B. E. Kueehle.....	788
Thomas, R. M., M.D., LeCompte, P. M., M.D., and Winternitz, M. C., M.D. The Biology of Arteriosclerosis	1136
Tibbits, Clark, and Collins, Selwyn D. Research Memorandum on Social Aspects of Health in the Depression.....	101
Tobey, James A., Dr.P.H. Federal and State Control of Milk Prices.....	102, 220
Todd, T. Wingate, and Associates (1926-1936). Atlas of Skeletal Maturation (Hand) ..	1130
Toxiology. William D. McNally, A.B., M.D.	664
Traffic in Health, The. Charles Solomon.....	528, 1333
Trauma and Disease. Edited by Leopold Brahdv and Samuel Kahn.....	528
Truth About Childbirth, The. Anthony M. Ludoviel.....	532
Tuberculosis Among Children and Young Adults (2nd ed.). J. Arthur Myers, Ph.D., M.D.	886
Tuberculosis Education: A Guide for Professional and Lay Workers. Elma Rood.....	525
Turner, C. E. Personal Hygiene.....	525
Turner, C. E., Dr.P.H., Sc.D., and Collins, George B.: Cleanliness and Health	885
Health	885
Twenty-five Years of Health Progress. Louis I. Dublin and Alfred J. Lotka.....	535
Underwood, Felix J., M.D., and Whitfield, R.N., M.D. Public Health and Medical Licensure in the State of Mississippi, 1798-1937.....	1432
Unzicker, Samuel P., and Gruenberg, Benjamin C. Science in Our Lives.....	1433
Van Blareom, Carolyn Conant, R.N. Getting Ready to Be a Mother (3rd ed.).....	534
van Rooyen, enlarged and rewritten by. Bacteriological Atlas (2nd ed.), by Richard Muir	600
Vance, Morgan, M.D., Helpert, Milton, M.D., and Gonzales, Thomas A., M.D. Legal Medicine and Toxicology	658
Victor, David. Father's Doing Nicely: The Expectant Father's Handbook. Foreword by George W. Kosmak, M.D.....	1005
Vincent, Elizabeth Lee, Ph.D. Mental Hygiene for Nurses.....	531, 1130
Vitamin B ₁ (Thiamin) and Its Use in Medicine. Robert R. Williams, Sc.D., and Tom D. Spies, M.D.	1344
Vitamins—In Theory and Practice (2nd ed.). Leslie J. Harris.....	524
von Eulenburg-Wiener, Renée. Fearfully and Wonderfully Made: The Human Organism in the Light of Modern Science.....	1351
Warbasse, James Peter. The Doctor and the Public.....	525
Ward, Henry B., Edited by. Some Fundamental Aspects of the Cancer Problem.....	96, 527
Water Supply and Sewerage. E. W. Steel.....	532
Wayland, Mary Marvin, A.M., R.N. The Hospital Head Nurse.....	1433
Ways to Community Health Education. Ira V. Hiseock, and Others.....	532
Weinberg, M., Nativelle, R., and Prevot, A. R. Les Microbes Anaerobies.....	534
White, Benjamin, Ph.D., with Robinson, Elliott Stirling, M.D., Ph.D., and Barnes, Laverne Almon, Ph.D. The Biology of Pneumococcus.....	663
Whitfield, R. N., M.D., and Underwood, Felix J., M.D. Public Health and Medical Licensure in the State of Mississippi, 1798-1937.....	1432
Who Gave the World Syphilis?—The Haitian Myth. Richmond C. Holcomb.....	527
Wiener, Renée von Eulenburg-. Fearfully and Wonderfully Made: The Human Organism in the Light of Modern Science.....	1351
Williams, Robert R., Sc.D., and Spies, Tom D., M.D. Vitamin B ₁ (Thiamin) and Its Use in Medicine	1344
Wingfield, R. C. Pulmonary Tuberculosis in Practice.....	887
Winslow, Charles-Edward Amory, Dr.P.H., and Hahn, Mary L. Let's Grow and Let's Stay Well	884
Winternitz, M. C., M.D., Thomas, R. M., M.D., and LeCompte, P. M., M.D. The Biology of Arteriosclerosis	1136
Wolberg, Lewis R., M.D. The Psychology of Eating.....	537
Wolfe, W. Béran. Successful Living.....	1353
Woman Surgeon, A. Rosalie Slaughter Morton.....	527
Wood, Thomas D., et al. Adventures in Living Series: Now We Are Growing—Many Ways of Living—Keeping Fit—Blazing the Trail—How We Live.....	525
Woods, Hilda M., and Russell, William T. An Introduction to Medical Statistics.....	1436
Wooten, Kathleen Wilkinson. A Health Education Workbook.....	525
Workbook in Health for High School Girls, A. Gladys B. Gogle.....	662
World Federation of Education Associations—Health Section Report: Seventh Biennial Conference, Tokyo, Japan, August, 1937.....	882
Yater, Wallace M. Fundamentals of Internal Medicine.....	530
Your Diet and Your Health. Morris Fishbein, M.D.....	400

	Page
Books of Special Interest to Public Health Workers. Mazzyk P. Ravenel, M.D.....	521
Books Received	103, 221, 408, 539, 669, 791, 893, 1010, 1139, 1216, 1251, 1436
Borowski, Anthony J., Dr.P.H. Positions and Rates of Pay in Public Health Agencies....	1197
Boston. See Present Status of Safety Education in Some Representative School Systems.....	1175
John P. Sullivan, Ph.D.....	1175
Bovine Mastitis: The Relation of Streptococci to Physical Changes Occurring in the Udders of Dairy Cows. W. T. Miller and H. W. Johnson.....	1222
Bovine Origin, Human Tuberculosis of. Editorial.....	616
Bovine Tuberculosis and Tubercle Bacilli. New Light on Old Beliefs. Editorial.....	1118
Bovine Tuberculosis in Children. Editorial.....	1551
Bowdoin, C. D., M.D. Discussion, following "Gastrointestinal Disorder Not Proved To Be Water-Borne," by D. G. Gill, M.B., D.P.H., and James G. McAlpine, Ph.D.....	741
Bowerman, E. P., M.D., Kilmrough, R. C., M.D., and Cowell, D. M. M.D. Rural Syphilis—A Localized Outbreak. Monroe County, Tenn.....	756
Breed, Robert S., Ph.D., Chairman: Bacteriological Examination of Dairy Products. Report on Examination of Dairy and Food Products (Standard Methods).....	Year Book, 102
Standard Methods for the Examination of Dairy Products. Changes in New Edition....	1417
Brilliant Green Bile Broths to Detect Coliform Organisms in Pasteurized Milk, Formate Ricinolate and. I. C. Gunsalus and C. N. Stark.....	832
Bristol, Leverett D., M.D., Dr.P.H. What Every Health Officer Should Know About Industrial Hygiene	1080
Britten, Rolio H. Housing and Health.....	857
Brodie, Maurice, M.D. Pathological and Immunological Studies in Polymyositis—And Their Significance in Therapy and Treatment.....	716
Brooks, Paul, M.D. Secretary, Health Officers Section, A.P.H.A.	
Brown, Earle G., M.D. Value of the Vital Statistics Data on Birth and Death Certificates in County Health Work.....	1395
Brown, J. Howard, Ph.D. A Critical Discussion of Some Methods and Standards for Certified Milk	1053
Brown, Dr. Lawson. Editorial.....	108
Bubonic Plague. See Sylvatic Plague. K. F. Meyer, Ph.D., M.D.....	1153
Buehinder, Leon, Ph.D., Soloway, Mathilde, and Solotorovsky, Morris. Alpha Hemolytic Streptococci of Air	61
Buckner, Dorothy. Social Work and the Physically Handicapped Child in the Development of a New State Program.....	461
Buffalo, N. Y. See Investigation of Early Syphilis. William T. Clark, M.D., and Cleland A. Sargent, M.D.	807
Butter. See Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman	Year Book, 66
By-Laws, Constitution and—American Public Health Association.....	Year Book, 2
C	
California Society for the Promotion of Medical Research. See The So-Called Humane Pound Law in California [Antivivisection]. Editorial.....	510
California, The So-Called Humane Pound Law in [Antivivisection]. Editorial.....	510
Calver, Homer N., Chairman. Scientific Exhibits. Report of the Committee....	Year Book, 42
Calver, Homer N., and Dublin, Louis I., Ph.D. Health Education for the Millions.....	117
Camps. See Summer Camps.	
Cancer Death Records, Accuracy of the. Eleanor J. MacDonald.....	818
Cancer Program, A State. (Massachusetts.) Henry D. Chadwick, M.D., and Herbert L. Lombard, M.D.	14
Capes, William Farr. Politics in the Selection of Health Department Personnel—Is There a Remedy?	835
Caries. See Dental Caries.	
Carpenter, Lewis V., Setter, Lloyd R., and Weinberg, Morris. Chloramine Treatment of Sea Water	920
Carriers. See Typhoid.	
Carter, Dorothy J., R.N. The Public Health Nurse and Orthopedic Nursing Care.....	458
Cary, William H., Jr., C.E., and Hepler, John M., C.E. Health Hazards in the Dry Cleaning Industry. A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area.....	1020
Case of Public Health vs. Public Welfare, The. Homer Folks, LL.D.....	916
Cattaraugus County, N. Y., Tuberculosis Among Children and Young People in. John H. Korns, M.D.	167
Cause of Death, The Physician's Statement of. A. Hardisty Sellers, M.D., D.P.H.....	430
Census. See: Methods of Estimating Postcensal Populations. Henry S. Shryock, Jr., Ph.D.....	1042
What Every Health Officer Should Know About Vital Statistics. Jessamine S. Whitney..	1077
Century in Arrears, A. Presidential Address. Abel Wolman, Dr.Eng.....	1369
Certain Criteria in the Qualifications and Preparation of Health Officers. Henry E. Meleney, M.D.	423
Certified Milk, A Critical Discussion of Some Methods and Standards for. J. Howard Brown, Ph.D.	1053
Chadwick, Henry D., M.D., and Lombard, Herbert L., M.D. A State Cancer Program. (Massachusetts.)	14

House. See Milk and Dairy Products.	
Chemical Contamination of Food. Report of the Committee on Foods. Albert C. Hunter, Ph.D., Chairman	Page 52
Chemoprophylaxis in Poliomyelitis. Editorial	376
Child Health Programs Under the Social Security Act, Nutrition Services in Maternal and Marjorie M. Heseltine	813
Child Health to the General Health Program, Relationship of Maternal and. Thomas Parran, M.D.	236
Child Hygiene Section, A.P.H.A. Estella F. Warner, M.D., Secretary.	
Childhood, Heart Disease in. T. Duckett Jones	637
Children and Young People in Cattaraugus County, N. Y., Tuberculosis Among. John H. Korn, M.D.	167
Children, Evaluation of Dental Programs for. J. M. Wisan, D.D.S.	859
Chloramine Treatment of Sea Water. Lewis V. Carpenter, Lloyd R. Seftor, and Morris Weinberg	929
Choriomeningitis to Acute Aseptic Meningitis (Wallgren), Relation of Lymphocytic. R. D. Baird, M.D., and Thomas M. Rivers, M.D., Se.D.	47
Christmas Seal for 1938—National Tuberculosis Association	1319
City Public Health Program, The Nutritionist in a. Sophia S. Halsted	849
Civil Service. See Politics in the Selection of Health Department Personnel—Is There a Remedy? William Parr Capes	835
Clague, Ewan, Ph.D. Interrelationship of Health and Welfare Records and Statistics	599
Clark, William T., M.D., and Sargent, Cleland A., M.D. Investigation of Early Syphilis, Buffalo, N. Y.	807
Classification of Hospital Diagnosis. See A Tabular Outline for Use in Reporting Hospital Morbidity. Joseph Berkson, M.D.	723
Clothing Manufacturing Industry, Industrial Hygiene Applied to the. Wilmer H. Schulze, Ph.D.	476
Coffey, Julia M. Report of the Referee on Recognition and Significance of Hemolytic Streptococci in Infectious Diseases (Standard Methods). Evaluation of the Group-Precipitation Test in the Identification of Hemolytic Streptococci Pathogenic for Man	104
Coleman, Marion B. Report of the Referee on Serological and Bacteriological Procedures in the Diagnosis of Enteric Fevers (Standard Methods)	111
Coliform Organisms in Pasteurized Milk, Formate Ricinoleate and Brilliant Green Bile Broths to Detect. I. C. Gunsalus and C. N. Stark	832
Colleges and Universities. See Public Health Degrees and Certificates Granted in 1937. W. S. Leathers, M.D., Chairman	863
Collinson, John, M.D. Secretary, Vital Statistics Section, A.P.H.A.	
Colorado Public Health Association—New Affiliated Society, A.P.H.A.	1443
Committee, Report of:	
Accident Statistics. Robert J. Vane, Chairman	160
Analyzing Frozen Desserts and Ingredients. Food and Nutrition Chairman, J. H. Shrader, Ph.D., M.D.; Laboratory Chairman, Friend Lee Mickle, Se.D.	98
Bathing Places. Warren J. Scott, Chairman	119
Biology of the Laboratory Animal (Standard Methods). R. A. Kelsor, D.V.M., Chairman	101
Coördinating Committee on Standard Methods. A. Parker Hitchens, M.D., Chairman	95
Death Certification. Marjorie T. Bellows, Chairman	162
Diagnostic Procedures and Reagents (Standard Methods). William D. Stovall, M.D., Chairman	103
Examination of Dairy and Food Products (Standard Methods). Bacteriological Examination of Dairy Products. Robert S. Breed, Ph.D., Chairman	102
Examination of Water and Sewage (Standard Methods). Water Analysis. John F. Norton, Ph.D., Chairman	118
Foods. Chemical Contamination of Food. Albert C. Hunter, Ph.D., Chairman	52
Formas and Methods of Statistical Practice. Age Adjustment of Death Rates. A. W. Hedrich, Se.D., Chairman	161
Hygiene of Housing:	
Basic Principles of Healthful Housing. Preliminary Report. C.-E. A. Winslow, Dr.P.H., Chairman	251
See: Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts. C.-E. A. Winslow, Dr.P.H.	1269
Microbiological Methods of Food Examination. Development of Standard Methods for the Microbiological Examination of Foods. Lawrence H. James, Ph.D., Chairman	56
Milk and Dairy Products. Frederick W. Fabian, Ph.D., Chairman	65
Milk Supply. Walter von D. Tiedeman, Chairman	124
Nutritional Problems. Extent of Vitamin Deficiency in the United States. D. Breese Jones, Ph.D., Chairman	75
Professional Education:	
Educational Qualifications of Sub-Professional Field Personnel in Saultation. W. L. Leathers, M.D., Chairman	1233
Public Health Degrees and Certificates Granted in 1937. W. S. Leathers, M.D., Chairman	863

Committee, Report of—Continued	Page
Progress in and Present Status of Biologic Products. Elliott S. Robinson, M.D., Ph.D., Chairman	Year Book, 93
Public Health Dentistry. Guy S. Milberry, D.D.S., Chairman	Year Book, 44
Recognition and Significance of Hemolytic Streptococci in Infectious Diseases (Standard Methods). Evaluation of the Group-Precipitation Test in the Identification of Hemolytic Streptococci Pathogenic for Man. Julia M. Coffey, Referee	Year Book, 101
Recognition of Pneumococcus Types Associated with Pneumonia (Standard Methods). Elliott S. Robinson, M.D., Ph.D., Referee	Year Book, 108
Scientific Exhibits. Homer N. Calver, Chairman	Year Book, 42
School Health Service. Harold H. Mitchell, M.D., Chairman	Year Book, 47
Serological and Bacteriological Procedures in the Diagnosis of Enteric Fevers (Standard Methods). Marion B. Coleman, Referee	Year Book, 111
Serological Tests for the Diagnosis of Syphilis (Standard Methods). Ruth Gilbert, M.D., Referee	Year Book, 112
Serological Tests for the Diagnosis of Syphilis (Standard Methods). Elizabeth Maltaner, Associate Referee	Year Book, 114
Shellfish. Progress Report. L. M. Fisher, D.P.H., Chairman	Year Book, 126
Summer Camps and Roadside Places. Trailer Camp Sanitation. Carl E. Green, Chairman	Year Book, 132
To Study Relationships Between Official and Nonofficial Public Health Nursing Agencies. Miriam Ames, R.N., Chairman	Year Book, 157
Ventilation and Atmospheric Pollution. Part I—Working Standards; Part II—Standard Methods for the Examination of Air. Reports by Emery R. Hayhurst, M.D., Ph.D., Chairman; C. P. Yaglou, Warren A. Cook, J. J. Bloomfield, William F. Wells, Chairmen	Year Book, 81
Water Supply. Water-Borne Outbreaks in the United States and Canada, 1930-1936, and Their Significance. Arthur E. Gorman, Chairman	Year Book, 137
Committees of the American Public Health Association: Standing Committees and Sub-Committees, 1937-1938	
Comparative Methods of Diagnosis of Rabies in Animals. Charles N. Lench, M.D.	Year Book, 15
Complement and Other Biological Materials, An Inexpensive Method for the Dehydration and Preservation of. Enrique E. Ecker, Ph.D., and L. Pillemmer, Ph.D.	162
Condensed Milk. See Analyzing Frozen Desserts and Ingredients. Report of the Joint Standard Methods Committee. J. H. Shrader, Ph.D., M.D., Chairman	1231
Conferences and Dates	114, 239, 420, 555, 691, 804, 905, 1027, 1152, 1267, 1368, 1457
Connecticut, Registration and Approval of Public Health Laboratories as Carried on in. Friend Lee Mickle, Sc.D.	1185
Connolly, Joel I. Plumbing in Low Cost Housing	954
Connolly, Mary P. What Every Health Officer Should Know About Health Education	1083
Constitution and By-Laws, American Public Health Association	Year Book, 2
Containers, Food. See:	
Disintegration of Paper Board for Bacteriological Examination. J. R. Sanborn	576
Microbial Flora of Paper Containers. Fred W. Tanner	587
Containers for Foods, Suitable Paper Wrappers and. J. R. Sanborn	571
Containers, Microbial Flora of Paper. Fred W. Tanner	587
Contrast, A. Effect of sanitation on Oriental pilgrimages. Editorial	874
Contributions of Edward Jenner to Modern Concepts of Heart Disease. O. F. Hedley, M.D. .	1165
Control of Nuisances. Edward Wright	579
Cook, Warren A., Chairman. Report of Sub-Committee on Chemical Procedures in Air Analysis	Year Book, 85
Coöperation Among the Health Authorities of the American Republics, Development of International. Hugh S. Cumming, M.D.	1193
Coördinating Committee on Standard Methods. Report of the Chairman, A. Parker Hitchens, M.D.	Year Book, 95
Cope, Elizabeth J., and Kasper, Joseph A., M.D. Cultural Methods for the Detection of Typhoid Carriers	1065
Coronary Sclerosis. See Contributions of Edward Jenner to Modern Concepts of Heart Disease. O. F. Hedley, M.D.	1165
Counter Freezer (for ice cream). See Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman	Year Book, 66
County Health Work, Value of the Vital Statistics Data on Birth and Death Certificates in. Earle G. Brown, M.D.	1398
Courses in Public Health, Summer School	682
Cowgill, D. M., M.D., Bowerman, E. P., M.D., and Kimbrough, R. C., M.D. Rural Syphilis—A Localized Outbreak. Monroe County, Tenn.	756
Cows, The Relation of Streptococci to Physical Changes Occurring in the Udders of Dairy. Bovine Mastitis. W. T. Miller and H. W. Johnson	1222
Cox, Wesley C., M.D. Use of Dishwashing Machines: Pasteurization of Eating Utensils .	174
Craig, Charles F., M.D. A Suggested Program of Control of Amebiasis by Health Departments	187
Crain, Gladys L., R.N. The Role of the Nurse in the Control of Syphilis and Gonorrhea . .	181
Creswell, Samuel M.—Death of. Editorial	1120
Crippled Child Symposium. See Symposia	
Crippling Diseases, Preventive Aspects of. H. E. Hilleboe, M.D.	451
Critical Discussion of Some Methods and Standards for Certified Milk. A. J. Howard Brown, Ph.D.	1053

	Page
Crothers, Bronson, M.D. Education of the Handicapped Child.....	310
Croydon [England] Epidemic of Typhoid Fever, The. Editorial.....	641
Culture Media Employed for the Analysis of <i>Escherichia-Aerobacter</i> Members in Milk, Dye Concentration in. Herbert D. McAuliffe and M. A. Farrell.....	1217
Cultural Methods for the Detection of Typhoid Carriers. Elizabeth J. Cope and Joseph A. Kasper, M.D.	1065
Cumming, Hugh S., M.D. Development of International Cooperation Among the Health Authorities of the American Republics.....	1193
Cummings, George D., Ph.D. Secretary, Laboratory Section, A.P.H.A.	
Curry, Joseph M., D.V.S., Horowitz, Louis J., Harning, Benjamin G., M.D., and Marden, Katherine. Administrative Control of Food Handlers and Places Dispensing Food and Drinks (Hartford, Conn.) . . .	1277

D

Dailey, Edwin F., M.D., Hayes, Clara E., M.D., Dunham, Ethel C., M.D., and Tandy, Eliza- beth C., D.Sc. Problem of the Causes of Stillbirth.....	491
Dairy and Food Products, Symposium. See Symposia.	
Dairy Laboratories. See Registration and Approval of Public Health Laboratories as Carried on in Connecticut. Friend Lee Mickle, Sc.D.....	1185
Dairy Products. See Milk.	
Dairy Products, Bacteriological Examination of. Report on Examination of Dairy and Food Products (Standard Methods). Robert S. Breed, Ph.D., Chairman....Year Book,	102
Dark Adaptation Test for Vitamin A Deficiency, The. Carroll E. Palmer, M.D.....	269
Dead Hand of Authority, The. Oliver Wendell Holmes quoted. Editorial.....	872
Dean, Archibald S., M.D., Dr.P.H., and Hyman, Samuel, M.D. Alum Precipitated Toxoid for the Prevention of Diphtheria.....	1170
Death Certificates in County Health Work, Value of the Vital Statistics Data on Birth and, Earle G. Brown, M.D.....	1338
Death Certificates, Standard Birth and. Editorial.....	79
Death Certification. Report of the Committee. Marjorie T. Bellows, Chairman. Year Book,	162
Death, The Physician's Statement of Cause of. A. Hardisty Sellers, M.D., D.P.H.....	430
Death to Changing Needs of the Medical Profession and Public Health Groups, Adaptation of the International List of Causes of. Halbert L. Dunn, M.D., Ph.D.....	283
Death Notices:	114, 412, 546, 689, 803, 897, 1018, 1258
Barth, George P., M.D.....	412
Bracken, Henry Martyn, M.D.....	1368
Bradley, Prof. Theodore J.....	412
Brown, Lawrason, M.D.	198, 412
Buice, W. Alfred.....	897
Buntin, William C., M.D.....	412
Coffey, Ada B., R.N.....	412
Copeland, Royal S., M.D.....	903, 1018
Crandall, Ella Phillips.....	1456
Creswell, Samuel M., M.D.....	1120, 1258
Eaton, Paul, M.D.....	1018
Elgin, W. F., M.D.....	803, 897
Force, John N., M.D., Dr.P.H.....	1018, 1026
Foster, James H.....	1026
Fowler, Robert W., M.D.....	803, 897
Frost, Wade Hampton, M.D.....	773, 801, 897
Gibbs, Arthur M., M.D., C.P.H.....	897
Gleason, Marion A., M.D.....	412
Grinnell, Francis B., M.D.....	114
Hall, Maurice Crowther, Ph.D., Sc.D., D.V.M.....	901, 1018
Hanson, Ethel M.....	419
Havey, I. Malinde, R.N.....	1267
Hiatt, Edgar R., M.D.....	546
Hood, Charles H., D.Sc.....	412
Jones, Vera H., M.D.....	1018
Kaufman, Charles E., M.D.....	114, 412
Kline, Charles D., M.D.....	412
Laidlaw, Frank W., M.D.....	1368
LaWall, Charles Herbert, Phar.D., Sc.D.....	235, 412
Leitch, Renwick H., D.Sc.....	1018
Lery, Ernest Coleman, M.D.....	1368
Lucier, Mary	1026, 1258
Mallon, Mary. "Typhoid Mary" Dies of Stroke at 68.....	1451
Moffitt, Lloyd, M.D.....	1258
Muldowney, John J., M.D.....	1026
Nolte, August G.....	412
Neisser, Professor Dr. Max.....	804
Nuttall, George Henry Falkiner, M.D., F.R.S.....	419
Olin, Richard M.....	1368
Pickel, D. C., Ph.D.....	546
Pinneo, Frank Wilcox, M.D.....	238

	Page
Death Notices—Continued	
Plummer, Henry S., M.D.....	897
Radebaugh, Gus H.....	419, 546
Roberts, William F., M.D.....	412
Rockwell, T. H., M.D.....	412
Roth, George H., M.D.....	412
Rowland, Henry A.....	419, 546
Ryan, John N., M.D.....	412
Smith, DeWitt T., M.D.....	689, 697
Spector, Dr. Bertha Kaplan.....	1451
"Typhoid Mary" [Mary Mallon] Dies of Stroke at 68.....	412
Waterman, Jason.....	804, 807
Watkins, Frank L., M.D.....	804
White, Benjamin, Ph.D.....	412
Zoeiler, L. J.....	
Deaths, Allocation of. Reprint of Medical Officer (London) comment on article by Elizabeth Parkhurst, Journal, July, 1937.....	27
Deceased Members. See Death Notices.	
Degrees and Certificates Granted in 1937, Public Health. W. S. Leathers, M.D., Chairman.....	863
Dehydration and Preservation of Complement and Other Biological Materials, An Inexpensive Method for the. Enrique E. Ecker, Ph.D., and L. Pillemer, Ph.D.....	1231
Dental Caries in Relation to Nutrition, Present Status of. Nina Simmonds, Sc.D.....	1381
Dental Caries, Lactobacillus Acidophilus and. Philip Jay, D.D.S.....	759
Dental Caries, Nutrition and. Blon R. East, D.D.S.....	72
Dental Caries. See Nutritional Influence on Teeth. Frances Krasnow, Ph.D.....	325
Dental Health Program, Indiana's. Howard B. Mettel, M.D., and Mary H. Wesifall, D.D.S.....	949
Dental Programs for Children, Evaluation of. J. M. Wisan, D.D.S.....	859
Dentistry, Public Health. Report of the Committee. Guy S. Millberry, D.D.S., Chairman.....	Year Book, 44
Dermatitis, Industrial. See Diagnosis of Industrial Skin Diseases. Louis Schwartz, M.D.....	593
Determining Population in Intercensal and Postcensal Years by Means of Continuous Population Registers. Dorothy Swaine Thomas, Ph.D.....	28
Detroit: Health Hazards in the Dry Cleaning Industry. A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area. William H. Cary, Jr., C.E., and John M. Hepler, C.E.....	1029
Detroit, Measles in, 1935. I. Factors Influencing the Secondary Attack Rate Among Susceptibles at Risk. Franklin H. Top, M.D.....	935
Detroit. See The Nutritionist in a City Public Health Program. Sophia S. Halsted.....	849
Deutsch, Naomi, R.N. What Every Health Officer Should Know About Public Health Nursing.....	1087
Development of an Industrial Hygiene Program in a State Health Department. H. F. Eason, M.D., and M. F. Trice.....	610
Development of Industrial Hygiene in the United States. J. J. Bloomfield.....	1388
Development of International Cooperation Among the Health Authorities of the American Republics. Hugh S. Cumming, M.D.....	1193
Development of Standard Methods for the Microbiological Examination of Foods. Report of the Committee on Microbiological Methods of Food Examination. Lawrence H. James, Ph.D., Chairman.....	Year Book, 56
Diabetes—An Important Public Health Problem. Charles F. Bolduan, M.D.....	21
Diagnosis of Industrial Skin Diseases. Louis Schwartz, M.D.....	593
Diagnosis Reporting. See A Tabular Outline for Use in Reporting Hospital Morbidity. Joseph Berkson, M.D.....	723
Diagnostic Procedures and Reagents. Report of the Standard Methods Committee. William D. Stovall, M.D., Chairman. (See "Standard Methods" for Referee reports.).....	Year Book, 103
Diarrhea of the New-Born, Epidemic. III, Epidemiology of Outbreaks of Highly Fatal Diarrhea Among New-Born Babies in Hospital Nurseries. Samuel Frant, M.D., and Harold Abramson, M.D.....	36
Diarrheal Disorders, The Acute. A. V. Hardy, M.D., Dr.P.H., and James Watt, M.D.....	730
Dick Tests. See Scarlet Fever Control. Edward R. Krumbiegel, M.D.....	1096
Dick Toxin. See Scarlet Fever Immunization with Formalinized Toxin. A Preliminary Report. Gaylord W. Anderson, M.D.....	123
Diet. See Nutrition, Nutritional.	
Difficulties Encountered in Pneumococcal Type Determination. Annabel W. Waller.....	54
Diphtheria, Alum Precipitated Toxoid for the Prevention of. Archibald S. Dean, M.D., Dr.P.H., and Samuel Hyman, M.D.....	1170
Diphtheria Immunization. Editorial.....	1236
Diphtheria, Immunization Against. See Schick Reactions in Students of Medicine. H. C. Pulley and Moyer S. Fleisher.....	854
Diphtheria. See The Familial Aggregation of Infectious Diseases. Wade H. Frost, M.D., M.D., and Elliott H. Pennell.....	7
Directories of Health Officers. See Tenure of Office for Health Officers. Joseph W. Mountin, M.D., and Elliott H. Pennell.....	1311
Dishwashing Machines, Use of: Pasteurization of Eating Utensils. Wesley C. Cox, M.D.....	174
Disintegration of Paper Board for Bacteriological Examination. J. R. Sanborn.....	576
Dispensing Food and Drinks, Administrative Control of Food Handlers and Places (Hartford Conn.). Katherine Marden, Joseph M. Curry, D.V.S., Louis J. Horowitz, and Benjamin G. Horning, M.D.....	1277

Dried Foods. See Microbiological Examination of Foods.	Page
Drug Evil, The. See Patent Medicines and Advertisers. Editorial.....	1332
Dry Cleaning Industry, Health Hazards in the. A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area. William H. Cary, Jr., C.E., and John M. Hepler, C.E.....	1029
Dry Milk Institute. See Frozen Desserts.	
Dublin, Louis I., Ph.D., and Calver, Homer N. Health Education for the Millions.....	117
Dugan, F. C., C.E. Discussion, following "Essentials of an Effective State Plan and Program of Activities for Flood Sanitation," by C. W. Klassen and Arthur P. Miller, C.E.....	276
Dunkam, Ethel C., M.D., Tandy, Elizabeth C., D.Sc., Daily, Edwin F., M.D., and Hayes, Clara E., M.D. Problem of the Causes of Stillbirth.....	491
Dunn, Halbert L., M.D., Ph.D. Adaptation of the International List of Causes of Death to Changing Needs of the Medical Profession and Public Health Groups.....	283
Dust. See Lung Findings in Foundry Workers—A Four Year Survey. O. A. Sander, M.D.	601
Dusts. See Ventilation and Atmospheric Pollution.	
Dutchess County, N. Y., Project: Nutritional Education in the Home. Bertrand E. Roberts, M.D.	914
Dye Concentration in Culture Media Employed for the Analysis of Escherichia-Aerobacter Members in Milk. Herbert D. McAuliffe and M. A. Farrell.....	1217
Dysentery. See The Acute Diarrheal Disorders. A. V. Hardy, M.D., Dr.P.H., and James- Watt, M.D.	730

E

Easom, H. F., M.D., and Trice, M. F. Development of an Industrial Hygiene Program in a State Health Department	610
East, Bion R., D.D.S. Nutrition and Dental Caries.....	72
Eating Utensils, Pasteurization of—Use of Dishwashing Machines. Wesley C. Cox, M.D....	174
Ecker, Enrique E., Ph.D., and Pillemcr, L., Ph.D. An Inexpensive Method for the Dehydration and Preservation of Complement and Other Biological Materials.....	1231

Editorials:

Air-Borne Infection	195
Air Raids, The Fear of.....	1334
Airplane and Yellow Fever, The.....	1116
American Museum of Health, An.....	771
Antityphoid Vaccine During Epidemics, The Use of.....	378
Antivivisection. See The So-Called Humane Pound Law in California.....	510
Auto Trailer, The	961
Billings, John Shaw—Born April 12, 1838.....	1423
Birth and Death Certificates, Standard.....	79
Bovine Origin, Human Tuberculosis of.....	646
Bovine tuberculosis and tubercle bacilli. New Light on Old Beliefs.....	1119
Bovine Tuberculosis in Children.....	1334
Brown, Dr. Lawrason.....	198
California Society for the Promotion of Medical Research. See The So-Called Humane Pound Law in California [Antivivisection].....	510
California, The So-Called Humane Pound Law in [Antivivisection].....	510
Chemoprophylaxis in Poliomyelitis	376
Children, Bovine Tuberculosis in.....	1334
Contrast, A. [Effect of sanitation on Oriental pilgrimages].....	874
Creswell, Samuel M.—Death of.....	1120
Croydon [England] Epidemic of Typhoid Fever, The.....	644
Dead Hand of Authority, The. Oliver Wendell Holmes quoted.....	872
Death Certificates, Standard Birth and.....	79
Diphtheria Immunization	1236
Drug Evil, The. See Patent Medicines and Advertisers.....	1332
England. See The Croydon Epidemic of Typhoid Fever.....	644
England, Health Education Campaign in. See "Strength Is Incapable of Effort, Wealth Useless and Eloquence Powerless if Health Be Wanting".....	373
England Recognizes Preventive Medicine, The King of.....	649
England, Safe Milk for?.....	647
Estimates of Nutritional Status. Comment on "Public Health Reports" paper.....	871
Fear of Air Raids, The.....	1334
Federal Laws Relating to Foods, Drugs, and Cosmetics, The New.....	1114
Food, Drug, and Cosmetic Act. See Patent Medicine and Advertisers.....	1332
Food Poisoning by Staphylococci.....	1235
Foods, Drugs, and Cosmetics, The New Federal Laws Relating to.....	1114
Frost, Wade Hampton [Death of].....	773
Godfrey, Edward S., Jr.....	1422
Holmes, Oliver Wendell, quoted. The Dead Hand of Authority.....	872
Housing, Some Public Health Aspects of.....	776
Human Tuberculosis of Bovine Origin.....	646
India. See A Contrast.....	874
"It Can't Be Done Under Our Law." [Modernizing Public Health Laws.].....	508
Journal Policy	198
King of England Recognizes Preventive Medicine, The.....	649

Editorials—Continued	Page
Medical Care, Report of the Technical Committee on. The Need for a National Health Program	506
Metropolitan Life Insurance Company Report. See "Nineteen Thirty-Seven a Star Health Year"	510
Milk for England, Safe?	647
Milk, Raw or Pasteurized?	1424
Museum of Health, An Amerlean	771
National Health Program, The Need for a. Report of the Technical Committee on Medical Care	506
Need for a National Health Program, The. Report of the Technical Committee on Medical Care	506
New Federal Laws Relating to Foods, Drugs, and Cosmetics	1114
New Light on Old Beliefs. Bovine tuberculosis and tubercle bacilli	1118
New York World's Fair, 1939. An American Museum of Health	771
Newer Knowledge of Poliomyelitis	776
"Nineteen Thirty-Seven a Star Health Year." Metropolitan Life Insurance Company Report	510
Nutritional Status, Estimates of. Comment on "Public Health Reports" paper	871
Oriental pilgrimages, Effect of sanitation on. A Contrast	874
Our Sixty-Seventh Annual Meeting [Kansas City, Mo., October 25-28, 1938]	1420
Pasteurized Milk, Raw or?	1424
Patent Medicine and Advertisers	1332
Poison Gas, Protection Against	379
Poliomyelitis, Chemoprophylaxis in	376
Poliomyelitis, Newer Knowledge of	776
Protection Against Poison Gas	379
Public Health Aspects of Housing, Some	776
Public Health Expanding	193
Public Health Laws, Modernization of. See "It Can't Be Done Under Our Law."	508
"Public Health Reports" paper, comment on. Estimates of Nutritional Status	871
Raw or Pasteurized Milk?	1424
Safe Milk for England?	647
Sanitation in the Next War	374
Serodiagnosis of Syphilis	375
Sixty-Seventh Annual Meeting, Our [Kansas City, Mo., October 25-28, 1938]	1420
Sixty-Seventh Annual Meeting, The (Kansas City)	1234
So-Called Humane Pound Law in California, The [Antivivisection]	510
Some Public Health Aspects of Housing	776
Standard Birth and Death Certificates	79
Sternberg, George Miller	774
Stream Pollution. See Vinson-Barkley Bill	77
"Strength Is Incapable of Effort, Wealth Useless and Eloquence Powerless If Health Be Wanting." [Health Education Campaign in England]	373
Suicide, An Unusual (by injection of bacilli)	1336
Syphilis, Serodiagnosis of	375
Trailer, The Auto	961
Tuberculosis, Bovine, in Children	1334
Tuberculosis of Bovine Origin, Human	646
Typhoid. See The Use of Antityphoid Vaccine During Epidemics	378
Typhoid Fever, The Croydon [England] Epidemic of	644
Unusual Suicide, An (by injection of bacilli)	1336
Use of Antityphoid Vaccine During Epidemics, The	378
Vaccine During Epidemics, The Use of Antityphoid	378
Veterinary Medicine, What We Owe to	199
Vinson-Barkley Bill [Stream Pollution]	77
Vivisection. See The So-Called Humane Pound Law in California	510
War. See:	
Protection Against Poison Gas	379
Sanitation in the Next War	374
Western Branch, American Public Health Association. Ninth Annual Meeting, Portland, Ore.	869
What We Owe to the Forefathers	962
What We Owe to Veterinary Medicine	199
Yellow Fever, The Airplane and	1116
 Editors, <i>American Journal of Public Health</i> : Mazzyk P. Ravenel, M.D., Editor; Reginald M. Atwater, M.D., Dr.P.H., Managing Editor; Augusta Jay, Editorial Associate.	
Editorial Board: Reginald M. Atwater, M.D., Dr.P.H. (Managing Editor), Chairman; Prof. Ira V. Hiscock; Kenneth F. Maxey, Dr.P.H., M.D.; Arthur P. Miller, C.E.; and Harry S. Mustard, M.D.	
Education for Schools, Visual. Pauline Brooks Williamson	278
Education for the Millions, Health. Louis I. Dublin, Ph.D., and Homer N. Calver	117
Education in the Home, Nutritional. Dutchess County, N. Y., Project. Bertrand E. Roberts, M.D.	944
Education of Physicians in Pediatrics, Postgraduate. Myron E. Wegman, M.D.	1072

	Page
Education of the Handicapped Child. Bronson Crothers, M.D.....	310
Education, What Every Health Officer Should Know About Health. Mary P. Connolly....	1053
Education. See Public Health Education Section.	
Educational Qualifications of Sub-Professional Field Personnel in Sanitation. Progress Report of the Committee on Professional Education. W. S. Leathers, M.D., Chairman..	1233
Eggs, Frozen. See Microbiological Examination of Foods.	
Elkind, Henry B., M.D. Is There an Epidemiology of Mental Disease?.....	215
Emergency Sanitation Measures, Federal Facilities to Expedite. R. E. Tarbett (Followed by Discussion, by J. K. Hoskins, C.E.).....	1091
Employment Service.....	100, 227, 413, 517, 681, 799, 898, 1018, 1145, 1258, 1363, 1449
Encephallitis in Man Due to the Eastern Virus of Equine Encephalomyelitis. Outbreak of. Roy Feemster, M.D., Dr.P.H.....	1403
Encephalomyelitis, Outbreak of Encephallitis in Man Due to the Eastern Virus of Equine. Roy F. Feemster, M.D., Dr.P.H.....	1403
Engineering in New York State, Projection of. W. H. Larkin, C.E.....	1257
Engineering, Public Health. See Public Health Engineering Section.	
Engineering. See Public Health Engineering.	
England, Health Education Campaign in. See "Strength Is Incapable of Effort. Wealth Useless and Eloquence Powerless If Health Be Wanting." Editorial.....	373
England Recognizes Preventive Medicine, The King of. Editorial.....	619
England, Safe Milk for? Editorial.....	617
England. See The Croydon Epidemic of Typhoid Fever. Editorial.....	614
Enteric Fevers, Serological and Bacteriological Procedures in the Diagnosis of. Report of the Standard Methods Committee. Marlon B. Coleman, Referee.....	Year Book, 111
Enteritis. See:	
A Water-Borne Outbreak of Gastroenteritis in a Tennessee Town. Crit Pharris, M.D., F. W. Kittrell, and W. C. Williams, M.D.....	736
Gastrointestinal Disorder Not Proved To Be Water-Borne. D. G. Gill, M.B., D.P.H., and James G. McAlpine, Ph.D. (Followed by Discussion, by C. D. Bowdalu, M.D.)..	741
The Acute Diarrheal Disorders. A. V. Hardy, M.D., Dr.P.H., and James Watt, M.D....	739
Epidemic Diarrhea of the New-Born. III, Epidemiology of Outbreaks of Highly Fatal Diarrhea Among New-Born Babies in Hospital Nurseries. Samuel Frant, M.D., and Harold Abramson, M.D.	36
Epidemic of Typhoid Fever Attributed to Salad Contaminated by a Chronic Typhoid Carrier, An. Paul A. Lembeke, M.D., and Paul von Haeseler, M.D.....	1212
Epidemiology of Trichinosis, The. C. D. Barrett, M.D., and Richard Sears, M.D.....	700
Epidemiology Section, A.P.H.A. Filp C. Forsberg, M.D., Secretary.	
Equal Opportunity for Health, An. The Honorable Herbert H. Lehman.....	1
Equine Encephalomyelitis, Outbreak of Encephallitis in Man Due to the Eastern Virus of. Roy F. Feemster, M.D., Dr.P.H.....	1403
Escherichia-Aerobacter Members in Milk, Dye Concentration in Culture Media Employed for the Analysis of. Herbert D. McAuliffe and M. A. Farrell.....	1217
Escherichia-Aerobacter Organisms. See Formate Kleinsolente and Brilliant Green Bile Broths to Detect Coliform Organisms in Pasteurized Milk. I. C. Gausalus and C. N. Stark....	832
Eskey, C. R., M.D. Fleas as Vectors of Plague.....	1305
(See also Sylvatic Plague, by K. F. Meyer, Ph.D., M.D., page 1153.)	
Essentials of an Effective State Plan and Program of Activities for Flood Sanitation. C. W. Klassen and Arthur P. Miller, C.E. (Followed by Discussion, by F. C. Dugan, C.E.)	263
Estimates of Nutritional Status. Comment on "Public Health Reports" paper. Editorial	871
E. Typhi in Sewage Treatment Plant Processes, Survival of. Carl E. Green and Paul J. Beard, Ph.D.	762
Evaluation of Dental Programs for Children. J. M. Wisan, D.D.S.....	859
Evaluation of Group-Precipitation Test in the Identification of Hemolytic Streptococci Pathogenic for Man. Report of the Standard Methods Committee on Recognition and Significance of Hemolytic Streptococci in Infectious Diseases. Julia M. Coffey, Referee..	Year Book, 104
Examination of Dairy and Food Products. Bacteriological Examination of Dairy Products (Standard Methods). Robert S. Breed, Ph.D., Chairman.....	Year Book, 102
Examination of Water and Sewage (Standard Methods). Water Analysis. John F. Norton, Ph.D., Chairman	Year Book, 118
Executive Staff, American Public Health Association.....	Year Book, 12
Exhibits, Scientific. Report of the Committee. Homer N. Calver, Chairman....	Year Book, 42
Experiments on Antirabic Vaccination With Tissue Culture Virus. Leslie T. Webster, M.D.	44
Extent and Seasonal Variations of Intermittency in Growth. C. E. Turner, Dr.P.H., Sc.D., and Alfred Nordstrom	499
Extent of Vitamin Deficiency in the United States. Report of the Committee on Nutritional Problems. D. Breese Jones, Ph.D., Chairman.....	Year Book, 75
Extermination, Supervision of Fumigation and. John Oberwager, M.D.....	633

F

Fabian, Frederick W., Ph.D., Chairman. Milk and Dairy Products. Report of the Committee	Year Book, 66
Fairbank, Lawrence T., Ph.D. Precision Methods in the Determination of the Heavy Metals..	825

	Page
Familial Aggregation of Infectious Diseases, The. Wade H. Frost, M.D.....	7
Farrell, M. A., and McAuliffe, Herbert D. Dye Concentration in Culture Media Employed for the Analysis of Escherichia-Aerobacter Members in Milk.....	1217 1334
Fear of Air Raids, The. Editorial.....	445
Feces, Organisms Involved in the Pollution of Water from Long Stored. Leland W. Parr, Ph.D.	1091
Federal Facilities to Expedite Emergency Sanitation Measures. R. E. Tarbett. (Followed by Discussion, by J. K. Hoskins, C.E.).....	1269
Federal Housing Acts, Opportunities and Responsibilities of the Health Officer in Con- nection with the. C.-E. A. Winslow, Dr.P.H.....	1114
Federal Laws Relating to Foods, Drugs, and Cosmetics, The New. Editorial.....	1403
Feemster, Roy F., M.D., Dr.P.H. Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis	907
Fellers, Carl R., Ph.D., Secretary, Food and Nutrition Section, A.P.H.A. Felt Hat Industry. See Mercury Poisoning from the Public Health Viewpoint. Paul A. Neal, M.D.	1233
Field Personnel in Sanitation, Educational Qualifications of Sub-Professional. Progress Report of the Committee on Professional Education. W. S. Leathers, M.D., Chairman..	120
Fisher, L. M., D.P.H., Chairman. Shellfish. Progress Report of the Committee..Year Book,	1305
Flies as Vectors of Plague. C. R. Eskey, M.D.....	(See also Sylvatic Plague, by K. F. Meyer, Ph.D., M.D., page 1153.)
Fleisher, Moyer S., and Pulley, H. C. Schlick Reactions in Students of Medicine.....	854
Fletcher, Alfred H., and Graves, L. M., M.D. Problems of a Housing Enforcement Pro- gram. Memphis, Tenn.	635
Flood (Ohio River, 1937). See Federal Facilities to Expedite Emergency Sanitation Mea- sures. R. E. Tarbett (Followed by Discussion, by J. K. Hoskins, C.E.).....	1091
Flood Sanitation, Essentials of an Effective State Plan and Program of Activities for. C. W. Klassen and Arthur P. Miller, C.E. (Followed by Discussion, by F. C. Dugan, C.E.)	263
Folks, Homer, LL.D. The Case of Public Health vs. Public Welfare.....	916
Food and Nutrition Section, A.P.H.A. Carl R. Fellers, Ph.D., Secretary	
Food Handlers and Places Dispensing Food and Drinks, Administrative Control of (Hart- ford, Conn.). Katherine Marden, Joseph M. Curry, D.V.S., Louis J. Horowitz, and Benjamin G. Horning, M.D.....	1277
Food in New York City, Supervision of. A. Lichterman, Phar.D.....	845
Food Poisoning by Staphylococci. Editorial.....	1235
Foods, Committee on. Chemical Contamination of Food. Albert C. Hunter, Ph.D., Chairman Year Book,	52
Foods:	
See: Containers; paper containers.	
See: Nutritional Education in the Home: Dutchess County, N. Y., Project. Bertrand E. Roberts, M.D.	944
Foods, Drugs, and Cosmetics Act. See Patent Medicines and Advertisers (Editorial).....	1332
Foods, Drugs, and Cosmetics, The New Federal Laws Relating to. Editorial.....	1114
Formalized Toxin, Scarlet Fever Immunization with. A Preliminary Report. Gaylord W. Anderson, M.D.	123
Formate Rhinocento and Brilliant Green Bile Broths to Detect Coliform Organisms in Pas- teurized Milk. I. C. Gunsalus and C. N. Stark.....	832
Forms and Methods of Statistical Practice, Committee on. Age Adjustment of Death Rates. A. W. Hedrich, Sc.D., Chairman.....	164
Forsbeck, Philip C., M.D. Secretary, Epidemiology Section, A.P.H.A. Foundry Workers, Lung Findings in—A Four-Year Survey. O. A. Sander, M.D.....	601
Frant, Samuel, M.D., and Abramson, Harold, M.D. Epidemic Diarrhea of the New-Born. III, Epidemiology of Outbreaks of Highly Fatal Diarrhea Among New-Born Babies in Hospital Nurseries	36
Freeman, Allen W., M.D. Mental Hygiene and the Health Department.....	241
Frost, Wade H., M.D. The Familial Aggregation of Infectious Diseases.....	7
Frozen desserts. See Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman	66
Frozen Desserts and Ingredients, Analyzing (Standard Methods). Reports of the Joint Standard Methods Committee. Food and Nutrition Chairman, J. H. Shrader, Ph.D., M.D.; Laboratory Chairman, Friend Lee Mickle, Sc.D.	98
Frozen eggs. See Development of Standard Methods for the Microbiological Examination of Foods. Report of the Committee on Microbiological Methods of Food Examination. Lawrence H. James, Ph.D., Chairman.....	56
Fuchsin Lactose Broth for the Confirmatory Test in Water Analysis, Revised. Cassandra Ritter	616
Fumigation and Extermination, Supervision of. John Oberwager, M.D.....	633
Fur cutters. See Mercury Poisoning from the Public Health Viewpoint. Paul A. Neal, M.D.	907

G

Gastroenteritis in a Tennessee Town, A Water-Borne Outbreak of. Crit Pharris, M.D., F. W. Kittrell, and W. C. Williams, M.D.....	736
Gastrointestinal Disorder Not Proved To Be Water-Borne. D. G. Gill, M.B., D.P.H., and James G. McAlpine, Ph.D. (Followed by Discussion, by C. D. Bowdoin, M.D.).....	741

Gastrointestinal Disorders Symposium. See Symposia.	Page
Geiger, J. C., M.D., and Hobmaier, M., M.D. Trichineliasis in San Francisco.	1203
Gilbert, Ruth, M.D. Report of the Referee on Serological Tests for the Diagnosis of Syphilis (Standard Methods)	Year Book, 112
Gill, D. G., M.B., D.P.H., and McAlpine, James G., Ph.D. Gastrointestinal Disorder Not Proved To Be Water-Borne. (Followed by Discussion, by C. D. Bowdoin, M.D.)	741
Glasses, beverage. See Administrative Control of Food Handlers and Places Dispensing Food and Drinks (Hartford, Conn.). Katherine Marden, Joseph M. Curry, D.V.S., Louis J. Horowitz, and Benjamin G. Horning, M.D.	1277
Godfrey, Edward S., Jr. Editorial.	1422
Gonorrhea, The Role of the Nurse in the Control of Syphilis and Gonorrhea. Gladys L. Crain, R.N.	181
Gonorrhea. See Venereal diseases.	
Goodrich, Charles H., M.D. The Health Department in the Field of Medicine. From the Standpoint of a Private Practitioner.	923
Gorman, Arthur E. Chairman. Water-Borne Outbreaks in the United States and Canada, 1930-1936, and Their Significance. Report of the Committee on Water Supply.	137
Gorman, Arthur E. Letter to the Editor regarding 1937 Report of the Committee on Water Supply	964
Graves, L. M., M.D., and Fletcher, Alfred H. Problems of a Housing Enforcement Program. Memphis, Tenn.	695
Gray, A. L., M.D., M.P.H. The Probable Typhoid Carrier Incidence in Mississippi.	1415
Green, Carl E., Chairman. Joint Committee on Summer Camps and Roadside Places. Trailer Camp Sanitation	Year Book, 132
Green, Carl E., and Beard, Paul J., Ph.D. Survival of E. Typhi in Sewage Treatment Plant Processes	762
Growth and Development of Rural Negro Children, Handicaps in the Normal. Hildrus A. Poindexter, M.D.	1048
Growth, Extent and Seasonal Variations of Intermittency in. C. E. Turner, Dr.P.H., Sc.D., and Alfred Nordstrom.	499
Gunsalus, I. C., and Stark, C. N. Formate Ricinoleate and Brilliant Green Bile Broths to Detect Coliform Organisms in Pasteurized Milk.	832

H

Halsted, Sophia S. The Nutritionist in a City Public Health Program.	849
Handicapped Child, Education of the. Bronson Crothers, M.D.	340
Handicapped Child in the Development of a New State Program, Social Work and the Physically. Dorothy Buckner	464
Handicapped child. See Crippled child.	
Handicaps in the Normal Growth and Development of Rural Negro Children. Hildrus A. Poindexter, M.D.	1048
Hardy, A. V., M.D., Dr.P.H., and Watt, James, M.D. The Acute Diarrheal Disorders.	730
Hartford, Conn. Administrative Control of Food Handlers and Places Dispensing Food and Drinks. Katherine Marden, Joseph M. Curry, D.V.S., Louis J. Horowitz, and Benjamin G. Horning, M.D.	1277
Hayes, Clara E., M.D., Dunham, Ethel C., M.D., Tandy, Elizabeth C., D.Sc., and Dally, Edwin F., M.D. Problem of the Causes of Stillbirth.	491
Hayhurst, Emery R., M.D., Ph.D., Chairman. Ventilation and Atmospheric Pollution. Report of the Committee. Part I—Working Standards; Part II, Standard Methods for the Examination of the Air. Reports by Emery R. Hayhurst, M.D., Ph.D., C. P. Yaglon, Warren A. Cook, J. J. Bloomfield, and William F. Wells.	Year Book, 81
Haythorn, Samuel R., M.D., and Meller, Harry B. Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia.	479
Hazards in the Dry Cleaning Industry, Health. A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area. William H. Cary, Jr., C.E., and John M. Hepler, C.E.	1029
Health Agencies, Positions and Rates of Pay in Public. Anthony J. Borowski, Dr.P.H.	1197
Health, An Equal Opportunity for. The Honorable Herbert H. Lehman.	1
Health Conference, National—A Review. Washington, D. C., July 18-20, 1938. Reginald M. Atwater, M.D., Dr.P.H.	1103
Health Conservation Contests, The.	795, 894, 1252
Health Conservation Contests, The. Cities, Counties and Districts.	Year Book, 39
Health Department in the Field of Medicine, The. R. H. Riley, M.D., Dr.P.H.	303
Health Department in the Field of Medicine, The. From the Standpoint of a Private Practitioner. Charles H. Goodrich, M.D.	923
Health Department Personnel, Politics in the Selection of. Is There a Remedy? William Parr Capes	835
Health Education for the Millions. Louis I. Dublin, Ph.D., and Homer N. Calver.	117
Health Education, What Every Health Officer Should Know About. Mary P. Connolly.	1083
Health Hazards in the Dry Cleaning Industry. A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area. William H. Cary, Jr., C.E., and John M. Hepler, C.E.	1029
Health Maintenance in Industry. Clarence D. Selby, M.D.	1325
Health of the Nation, The. Thomas Parran, M.D., Dr.P.H.	1376
Health Officer in Connection with the Federal Housing Acts, Opportunities and Responsibilities of the. C.-E. A. Winslow, Dr.P.H.	1260

	Page
Health Officers, Certain Criteria in the Qualifications and Preparation of. Henry E. Meleney, M.D.	425
Health officers' salaries. See Positions and Rates of Pay in Public Health Agencies. Anthony J. Borowski, Dr.P.H.	1197
Health Officers Section, A.P.H.A. Paul Brooks, M.D., Secretary.	1311
Health Officers, Tenure of Office for. Joseph W. Mountin, M.D., and Elliott H. Pennell.	1165
Heart Disease, Contributions of Edward Jenner to Modern Concepts of. O. F. Hedley, M.D.	637
Heart Disease in Childhood. T. Duckett Jones, M.D.	825
Heavy Metals, Precision Methods in the Determination of the. Lawrence T. Fairhall, Ph.D.	907
Heavy metals. See Mercury Poisoning from the Public Health Viewpoint. Paul A. Neal, M.D.	907
Heavy Metals Symposium. See Symposia.	
Hedley, O. F., M.D. Contributions of Edward Jenner to Modern Concepts of Heart Disease	1165
Hedrich, A. W., Sc.D., Chairman. Age Adjustment of Death Rates. Report of the Committee on Forms and Methods of Statistical Practice. Year Book,	164
Hemolytic Streptococci Pathogenic for Man, Evaluation of the Group-Precipitation Test in the Identification of. Report of the Standard Methods Committee on Recognition and Significance of Hemolytic Streptococci in Infectious Diseases. Julia M. Coffey, Referee Year Book,	104
Hepler, John M., C.E., and Cary, William H., Jr., C.E. Health Hazards in the Dry Cleaning Industry. A Preliminary Report of a Survey of Dry Cleaning Establishments in the Detroit Metropolitan Area	1029
Heseltine, Marjorie M. Nutrition Services in Maternal and Child Health Programs Under the Social Security Act.	813
Hilleboe, H. E., M.D. Preventive Aspects of Crippling Diseases.	451
Hinks, C. M., M.D. Achievements in Mental Hygiene and Promising Leads for Further Endeavor	251
Hiscock, Prof. Ira V. Member of the Editorial Board, American Journal of Public Health.	
Hitchens, A. Parker, M.D., Chairman. Coordinating Committee on Standard Methods. Report of the Chairman Year Book,	95
Hohmaier, M., M.D., and Geiger, J. C., M.D. Triebneliasis in San Francisco.	1203
Hogs:	
See: Pork food products.	
See: Trichinosis.	
Hohl, Nelson J., M.S., and Tiedeman, Walter von D., M.C.E. Improved Laboratory Control of Pasteurized Milk	629
Holmes, Oliver Wendell, quoted. The Dead Hand of Authority—editorial.	872
Hookworm Infestation. See Handicaps in the Normal Growth and Development of Rural Negro Children. Hildrus A. Poindexter, M.D.	1048
Horning, Benjamin G., M.D., Marden, Katherine, Curry, Joseph M., D.V.S., and Horowitz, Louis J. Administrative Control of Food Handlers and Places Dispensing Food and Drinks (Hartford, Conn.)	1277
Horowitz, Louis J., Horning, Benjamin G., M.D., Marden, Katherine, and Curry, Joseph M. Administrative Control of Food Handlers and Places Dispensing Food and Drinks (Hartford, Conn.).	1277
Horses. See Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis. Roy F. Peemster, M.D., Dr.P.H.	1403
Hoskins, J. K., C.E. Discussion, following "Federal Facilities to Expedite Emergency Sanitation Measures," by R. E. Tarbett.	1094
Hospital Morbidity, A Tabular Outline for Use in Reporting. Joseph Berkson, M.D.	723
Houlton, Ruth, R.N. Secretary, Public Health Nursing Section, A.P.H.A.	
Housing and Health. Rollo H. Britten.	957
Housing, Basic Principles of Healthful. Preliminary Report of the Committee on the Hygiene of Housing. C.-E. A. Winslow, Dr.P.H., Chairman.	351
Housing Enforcement Program, Problems of a. Memphis, Tenn. L. M. Graves, M.D., and Alfred H. Fletcher	695
Housing, Hygiene of—Symposium. See Symposia.	
Housing, Plumbing in Low Cost. Joel I. Connelly.	954
Housing, Some Public Health Aspects of. Editorial.	776
Housing. See Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts. C.-E. A. Winslow, Dr.P.H.	1269
Howell, Marion G., R.N., M.Sc. Preparing the Nurse to Meet Community Needs in Public Health	566
Human Tuberculosis of Bovine Origin. Editorial	646
Hunter, Albert C., Ph.D., Chairman. Chemical Contamination of Food. Report of the Committee on Foods Year Book,	52
Hygiene of Housing, Committee on the. Basic Principles of Healthful Housing. Preliminary Report. C.-E. A. Winslow, Dr.P.H., Chairman.	351
Hygiene of Housing Symposium. See Symposia.	
Hyman, Samuel, M.D., and Dean, Archibald S., M.D., Dr.P.H. Alum Precipitated Toxoid for the Prevention of Diphtheria.	1170

Ice cream and frozen desserts. See Milk and Dairy Products. Report of the Committee, Frederick W. Fabian, Ph.D., Chairman. Year Book,	66
---	----

	Page
Ice cream soda fountains. See Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman.....	Year Book, 66
Ice cream. See Frozen desserts.	
Immunization against diphtheria. See Schick Reactions in Students of Medicine. H. C. Pulley and Moyer S. Fleisher.....	854
Immunization of Nurses Against Scarlet Fever, Result of Active. Edwin H. Place, M.D.....	137
Immunization with Formalinized Toxin, Scarlet Fever. A Preliminary Report. Gaylord W. Anderson, M.D.	123
Immunological Studies in Poliomyelitis, Pathological and—And Their Significance in Therapy and Treatment. Maurice Brodie, M.D.	740
Improved Laboratory Control of Pasteurized Milk. Walter von D. Tiedeman, M.C.E., and Nelson J. Hohl, M.S.....	629
India. See A Contrast. Editorial.....	874
Indiana's Dental Health Program. Howard B. Mettel, M.D., and Mary H. Westfall, D.D.S....	949
Indigent, medical care for the. See The Case of Public Health vs. Public Welfare. Homer Folks, LL.D.	916
Industrial dusts. See Ventilation and Atmospheric Pollution.	
Industrial Hygiene Applied to the Clothing Manufacturing Industry. Wilmer H. Schulze, Ph.D.	476
Industrial Hygiene in the United States, Development of. J. J. Bloomfield.....	1388
Industrial Hygiene Program in a State Health Department, Development of. H. F. Eason, M.D., and M. F. Trice.....	610
Industrial Hygiene Section, A.P.H.A. W. J. McConnell, M.D., Secretary.	
Industrial Hygiene, What Every Health Officer Should Know About. Leverett D. Bristol, M.D., Dr.P.H.	1080
Industrial hygiene: See—	
Health Hazards in the Dry Cleaning Industry. William H. Cary, Jr., C.E., and John M. Hepler, C.E.	1029
Mercury Poisoning from the Public Health Viewpoint. Paul A. Neal, M.D.....	907
Occupational diseases.	
Precision Methods in the Determination of the Heavy Metals. Lawrence T. Fairhall, Ph.D.	825
Ventilation and Atmospheric Pollution.	
Industrial Skin Diseases, Diagnosis of. Louis Schwartz, M.D.....	593
Industries, offensive. See Control of Nuisances. Edward Wright.....	579
Industry, Health Maintenance in. Clarence D. Selby, M.D.....	1325
Industry, Syphilis Control in. R. R. Sayers, M.D.....	155
Industry, Syphilis Control in—Symposium. See Symposia.	
Inexpensive Method for the Dehydration and Preservation of Complement and Other Biological Materials. An. Enrique E. Ecker, Ph.D., and L. Pillemer, Ph.D.....	1231
Infantile paralysis. See Poliomyelitis.	
Infectious Diseases, The Familial Aggregation of. Wade H. Frost, M.D.....	7
Intermittency in Growth, Extent and Seasonal Variations of. C. E. Turner, Dr.P.H., Se.D., and Alfred Nordstrom.....	499
International Cooperation Among the Health Authorities of the American Republics, Development of. Hugh H. Cumming, M.D.	1193
International List of Causes of Death to Changing Needs of the Medical Profession and Public Health Groups, Adaptation of the. Halbert L. Dunn, M.D., Ph.D.....	283
Interrelationship of Health and Welfare Records and Statistics. Ewan Clague, Ph.D.....	599
Intestinal enteritis: See—	
A Water-Borne Outbreak of Gastroenteritis in a Tennessee Town. Crit Pharris, M.D., F. W. Kittrell, and W. C. Williams, M.D.	736
Gastrointestinal Disorder Not Proved To Be Water-Borne. D. G. Gill, M.B., D.P.H., and James G. McAlpine, Ph.D. (Followed by Discussion, by C. D. Bowdoin, M.D.).....	741
The Acute Diarrheal Disorders. A. V. Hardy, M.D., Dr.P.H., and James Watt, M.D.....	730
Intranasal Installations for poliomyelitis. See Pathological and Immunological Studies in Poliomyelitis—And Their Significance in Therapy and Treatment. Maurice Brodie, M.D.	746
Investigation of Early Syphilis. Buffalo, N. Y. William T. Clark, M.D., and Cleland A. Sargent, M.D.	807
Iowa. Rocky Mountain Spotted Fever and Tick Survey in. Carl F. Jordan, M.D., C.P.H....	1411
Is There an Epidemiology of Mental Disease? Henry B. Elkind, M.D.....	245
"It Can't Be Done Under Our Law." [Modernizing Public Health Laws.] Editorial.....	508

J

James, Lawrence H., Ph.D., Chairman. Development of Standard Methods for the Microbiological Examination of Foods. Report of the Committee on Microbiological Methods of Food Examination	Year Book, 56
Jay, Augusta. Editorial Associate, American Journal of Public Health.	
Jay, Philip, D.D.S. Lactobacillus Acidophilus and Dental Caries.....	759
Jenner, Edward—to Modern Concepts of Heart Disease, Contributions of. O. F. Hedley, M.D.	1165
Johnson, H. W., and Miller, W. T. Bovine Mastitis: The Relation of Streptococci to Physical Changes Occurring in the Udders of Dairy Cows.....	1222
Jones, D. Breese, Ph.D., Chairman. Extent of Vitamin Deficiency in the United States. Report of the Committee on Nutritional Problems.....	Year Book, 75

	Page
Jones, T. Duckett. Heart Disease in Childhood.....	637
Jordan, Carl F., M.D., C.P.H. Rocky Mountain Spotted Fever and Tick Survey in Iowa....	1411
Journal Policy. Editorial	198

K

Kansas City Meeting, The.....	1140
Kasper, Joseph A., M.D., and Cope, Elizabeth J. Cultural Methods for the Detection of Typhoid Carriers	1065
Kelser, R. A., D.V.M., Chairman. Biology of the Laboratory Animal. Report of the Standard Methods Committee	Year Book, 101
Kimbrongh, R. C., M.D., Cowgill, D. M., M.D., and Bowerman, E. P., M.D. Rural Syphilis—A Localized Outbreak. Monroe County, Tenn.	756
King of England Recognizes Preventive Medicine, The. Editorial.....	619
Kittrell, F. W., Williams, W. C., M.D., and Pharris, Crit, M.D. A Water-Borne Outbreak of Gastroenteritis in a Tennessee Town.....	736
Klassen, C. W., and Miller, Arthur P., C.E. Essentials of an Effective State Plan and Program of Activities for Flood Sanitation. (Followed by Discussion, by F. C. Dugan, C.E.) . . .	263
Korns, John H., M.D. Tuberculosis Among Children and Young People in Cattaraugus County, N. Y.	167
Krasnow, Frances, Ph.D. Nutritional Influence on Teeth.....	325
Krueger, Paul F. Discussion, following "Present Status of Phosphatase Test for Pasteurization," by Walter von Dohlen Tiedeman, M.C.E.	320
Krumbiegel, Edward R., M.D. Scarlet Fever Control.....	1096

L

Laboratories as Carried on in Connecticut, Registration and Approval of Public Health. Friend Lee Mickle, Sc.D.	1185
Laboratory Animal, Biology of the. Report of the Standard Methods Committee. R. A. Kelser, D.V.M., Chairman.....	Year Book, 101
Laboratory Control of Pasteurized Milk, Improved. Walter von D. Tiedeman, M.C.E., and Nelson J. Hohl, M.S.....	629
Laboratory Section, A.P.H.A. George D. Cummings, Ph.D., Secretary.	
Laboratory Section of the American Public Health Association, The. Report of the Archivist. Augustus B. Wadsworth, M.D.	Year Book, 92
Lactobacillus Acidophilus and Dental Caries. Philip Jay, D.D.S.....	759
Larkin, W. H., C.E. Projection of Public Health Engineering in New York State.....	1287
Laundry Practices, A Sanitary Study of Commercial. Lloyd Arnold, M.D.....	839
Leach, Charles N., M.D. Comparative Methods of Diagnosis of Rabies in Animals.....	162
Lead. See Precision Methods in the Determination of the Heavy Metals. Lawrence T. Fairhall, Ph.D. . . .	825
Leathers, W. S., Chairman, Committee on Professional Education: Educational Qualifications of Sub-Professional Field Personnel in Sanitation. Progress Report . . .	1233
Public Health Degrees and Certificates Granted in 1937.....	863
Lehman, Herbert H., The Honorable. An Equal Opportunity for Health.....	1
Lembecke, Paul A., M.D., and von Haeseler, Paul, M.D. An Epidemic of Typhoid Fever Attributed to Salad Contaminated by a Chronic Typhoid Carrier.....	1212
Letters to the Editor: Gorman, Arthur E. Regarding 1937 Report of the Committee on Water Supply.....	964
McCormack, Arthur T., M.D. Regarding Josephine Roehc on Medical Care.....	380
McIntosh, J. W., B.A., M.B., D.P.H. Regarding Food Handlers.....	650
Lichterman, A., Ph.D. Supervision of Food in New York City.....	845
Lombard, Herbert L., M.D., and Chadwick, Henry D., M.D. A State Cancer Program. (Massachusetts.) . . .	14
Lung Findings in Foundry Workers—A Four-Year Survey. O. A. Sander, M.D.....	601
Lymphocytic Choriomeningitis to Acute Aseptic Meningitis (Wallgren), Relation of. R. D. Baird, M.D., and Thomas M. Rivers, M.D., Sc.D.....	47

M

MacDonald, Eleanor J. Accuracy of the Cancer Death Records.....	818
Malaria. See Handicaps in the Normal Growth and Development of Rural Negro Children. Hildrus A. Poindexter, M.D.	1048
Mallon, Mary. "Typhoid Mary" Dies of Stroke at 68.....	1451
Malnutrition. See Handicaps in the Normal Growth and Development of Rural Negro Children. Hildrus A. Poindexter, M.D.	1048
Maltaner, Elizabeth. Report of the Associate Referee on Serological Tests for the Diagnosis of Syphilis (Standard Methods).....	Year Book, 114
Marden, Katherine, Curry, Joseph M., D.V.S., Horowitz, Louis J., and Horning, Benjamin G., M.D. Administrative Control of Food Handlers and Places Dispensing Food and Drinks (Hartford, Conn.)	1277

	Page
Massachusetts: See—	
A State Cancer Program. Henry D. Chadwick, M.D., and Herbert L. Lombard, M.D...	14
Control of Nuisances. Edward Wright.....	579
Mastitis. See Bovine mastitis.	
Mastitis, Bovine. The Relation of Streptococci to Physicall Changes Occurring In the Udders of Dairy Cows. W. T. Miller and H. W. Johnson.....	1222
Maternal and Child Health Programs Under the Social Security Act, Nutrition Services in. Marjorie M. Heseltine	813
Maternal and Child Health to the General Health Program, Relationship of. Thomas Parran, M.D.	250
Maternal care: See—	
Abortion and the Public Health. Regine K. Stix, M.D., and Dorothy G. Wichi.....	621
Problem of the Causes of Stillbirth. Ethel C. Dunham, M.D., Elizabeth C. Tandy, D.Sc., Edwin F. Daily, M.D., and Clara Hayes, M.D.....	491
Maxey, Kenneth F., M.D. Member of the Editorial Board, American Journal of Public Health.	
McAlpine, James G., Ph.D., and Gill, D. G., M.B., D.P.H. Gastrointestinal Disorder Not Proved To Be Water-Borne. (Followed by Discussion, by C. D. Bowdoin, M.D.).....	741
McAuliffe, Herbert D., and Farrell, M. A. Dye Concentration in Culture Media Employed for the Analysis of Escherichia-Aerobacter Members in Milk.....	1217
McCollum, E. V., Ph.D. Present Status of Vitamin Milks.....	1069
McConnell, W. J., M.D. Secretary, Industrial Hygiene Section, A.P.H.A.	
McCormack, Arthur T., M.D., Chairman on Public Health Aspects of Medical Care. Letter to the Editor—concerning address of Josephine Roche on "Medical Care as a Public Health Function," December, 1937, <i>Journal</i> , and containing Resolution.....	380
McIntosh, J. W., B.A., M.B., D.P.H. Letter to the Editor regarding Food Handlers.....	650
Mensles in Detroit, 1935. I. Factors Influencing the Secondary Attack Rate Among Susceptibles at Risk. Franklin H. Top, M.D.	935
Measles. See The Familial Aggregation of Infectious Diseases. Wade H. Frost, M.D.....	7
Measurement of Sanitary Ventilation. William Firth Wells and Mildred Weeks Wells.....	343
Ment Inspection Law. See Trichinellosis in San Francisco. M. Hobmaier, M.D., and J. C. Gelger, M.D.	1203
Medical Care, Report of the Technical Committee on. The Need for a National Health Program. Editorial	506
Medical care. See The Case of Public Health vs. Public Welfare. Homer Folks, LL.D.....	916
Medical students (St. Louis University School of Medicine). See Schick Reactions in Students of Medicine. H. C. Pulley and Moyer S. Fleisher.....	854
Medicine, The Health Department in the Field of. R. H. Riley, M.D., Dr.P.H.....	303
Medicine, The Health Department in the Field of. From the Standpoint of a Private Practitioner. Charles H. Goodrich, M.D.....	923
Meleney, Henry E., M.D. Certain Criteria in the Qualifications and Preparation of Health Officers	423
Meller, Harry B., and Haythorn, Samuel R., M.D. Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia.....	479
Memphis, Tenn. Problems of a Housing Enforcement Program. L. M. Graves, M.D., and Alfred H. Fletcher.....	695
Meningitis (Wallgren), Relation of Lymphocytic Choromeningitis to Acute Aseptic. R. D. Baird, M.D., and Thomas M. Rivers, M.D., Sc.D.....	47
Mental Disease, Is There an Epidemiology of? Henry B. Elkind, M.D.....	245
Mental Hygiene and Promising Leads for Further Endeavor, Achievements in. C. M. Hincks, M.D.	251
Mental Hygiene and the Health Department. Allen W. Freeman, M.D.....	241
Mental Hygiene Symposium. See Synposia.	
Mercury Poisoning from the Public Health Viewpoint. Paul A. Neal, M.D.....	907
Metals, Precision Methods in the Determination of the Heavy. Lawrence T. Fairhall, Ph.D.	825
Methods and Standards for Certified Milk, A Critical Discussion of Some. J. Howard Brown, Ph.D.	1033
Methods of Estimating Postcensal Populations. Henry S. Shryock, Jr., Ph.D.....	1042
Metropolitan Life Insurance Company Report. See "Nineteen Thirty-Seven a Star Health Year." Editorial	510
Mettel, Howard B., M.D., and Westfall, Mary H., D.D.S. Indiana's Dental Health Program	949
Meyer, K. F., Ph.D., M.D. Sylvatic Plague.....	1153
Mickle, Friend Lee, Sc.D., Laboratory Chairman. Analyzing Frozen Desserts and Ingredients. Report of the Joint Standard Methods Committee..... Year Book,	98
Mickle, Friend Lee, Sc.D. Registration and Approval of Public Health Laboratories as Carried on in Connecticut.....	1185
Microbial Flora of Paper Containers. Fred W. Tanner.....	587
Microbiological Methods of Food Examination, Committee on. Development of Standard Methods for the Microbiological Examination of Foods. Lawrence H. James, Ph.D., Chairman	56
Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman	66
Milk, Certified—A Critical Discussion of Some Methods and Standards for. J. Howard Brown, Ph.D.	1033
Milk containers, paper: See—	
Disintegration of Paper Board for Bacteriological Examination. J. R. Sanborn.....	576
Microbial Flora of Paper Containers. Fred W. Tanner.....	587
Suitable Paper Wrappers and Containers for Foods. J. R. Sanborn.....	571

	Page
Milk, Dye Concentration in Culture Media Employed for the Analysis of Escherichia-Aerobacter Members in. Herbert D. McAuliffe and M. A. Farrell.....	1217
Milk for England, Safe? Editorial	647
Milk, Formate Ricinoleate and Brilliant Green Bile Broths to Detect Coliform Organisms in Pasteurized. I. C. Gunsalus and C. N. Stark.....	832
Milk, Improved Laboratory Control of Pasteurized. Walter von D. Tiedeman, M.C.E., and Nelson J. Hohl, M.S.....	620
Milk powder. See Analyzing Frozen Desserts and Ingredients. Report of the Joint Standard Methods Committee. J. H. Shrader, Chairman.....	Year Book, 49
Milk, Raw or Pasteurized? Editorial.....	1424
Milk Supply. Report of the Committee. Walter von D. Tiedeman, Chairman....	Year Book, 124
Milk, Vitamin D. See Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman	Year Book, 66
Milk: See—	
Bovine Mastitis: The Relation of Streptococci to Physical Changes Occurring in the Udders of Dairy Cows. W. T. Miller and H. W. Johnson.....	1222
Paper containers.	
Phosphatase test.	
Practical Experience with the Scherer Rapid Field Test for Pasteurization. D. M. Roger	1325
Present Status of Vitamin Milks. E. V. McCollum, Ph.D.....	1069
Registration and Approval of Public Health Laboratories as Carried on in Connecticut. Friend Lee Mickle, Sc.D.....	1185
Standard Agar Counts as Compared With Counts on Improved Agars at 32° C. M. W. Yale, Ph.D.	148
Milberry, Guy S., D.D.S., Chairman. Public Health Dentistry. Report of the Committee..	Year Book, 44
Miller, Arthur P., C.E. Member of the Editorial Board, American Journal of Public Health.	
Miller, Arthur P., C.E., and Klassen, C. W. Essentials of an Effective State Plan and Program of Activities for Flood Sanitation. (Followed by Discussion, by F. C. Dugan, C.E.)	203
Miller, W. T., and Johnson, H. W. Bovine Mastitis: The Relation of Streptococci to Physical Changes Occurring in the Udders of Dairy Cows.....	1222
Mississippi, The Probable Typhoid Carrier Incidence in. A. L. Gray, M.D., M.P.H.....	1415
Mitchell, Harold H., M.D., Chairman. School Health Service. Report of the Committee..	Year Book, 47
Monkeys: See—	
Acquired Tuberculosis in the Primate in Laboratories and Zoölogical Collections. C. R. Schroeder, D.V.M.	469
Pathological and Immunological Studies in Poliomyelitis—And Their Significance in Therapy and Treatment. Maurice Brodie, M.D.....	746
Monroe County, Tenn. Rural Syphilis—A Localized Outbreak. R. C. Kimbrough, M.D., D. M. Cowgill, M.D., and E. P. Bowerman, M.D.....	756
Morbidity, A Tabular Outline for Use in Reporting Hospital. Joseph Berkson, M.D.....	723
Morbidity and Mortality in the United States Navy. A Time-Study of. John M. Wheelis, Jr., M.D.	1291
More Effective School Health Program, A. John T. Phair, M.D., D.P.H.....	1059
Morris, Woodbridge E., M.D. Nutrition Program in a State Health Department.....	718
Mortality in the United States Navy, A Time-Study of Morbidity and. John M. Wheelis, Jr., M.D.	1291
Mountin, Joseph W., M.D., and Pennell, Elliott H. Tenure of Office for Health Officers....	1311
Museum of Health, An American. Editorial.....	771
Mustard, Harry S., M.D. Member of the Editorial Board, American Journal of Public Health.	

N

Nasal sprays as a method of prevention (Poliomyelitis). See Pathological and Immunological Studies in Poliomyelitis—And Their Significance in Therapy and Treatment. Maurice Brodie, M.D.	746
National Health Conference [Washington, D. C., July 18–20, 1938]—A Review. Reginald M. Atwater, M.D., Dr.P.H.....	1103
National Health Conference, Washington, D. C. See:	
A Century in Arrears. Abel Wolman, Dr.Eng.....	1369
The Health of the Nation. Thomas Parran, M.D., Dr.P.H.....	1376
National Health Program, The Need for a. Report of the Technical Committee on Medical Care. Editorial	506
National Organization for Public Health Nursing. See What Every Health Officer Should Know About Public Health Nursing. Naomi Deutsch, R.N.....	1087
National Tuberculosis Association—1938 Christmas Seal.....	1310
Navy, A Time-Study of Morbidity and Mortality in the United States. John M. Wheelis, Jr., M.D.	1291
Neal, Paul A., M.D. Mercury Poisoning from the Public Health Viewpoint.....	907
Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia. Samuel R. Haythorn, M.D., and Harry B. Meller.....	479
Need for a National Health Program, The. Report of the Technical Committee on Medical Care. Editorial	506

	Page
Negro Children, Handicaps in the Normal Growth and Development of Rural. Hildrus A. Polndexter, M.D.	1048
New Federal Laws Relating to Foods, Drugs and Cosmetics. Editorial.....	1114
New Light on Old Beliefs. Bovine tuberculosis and tubercle bacilli. Editorial.....	1118
New York City, Supervision of Food in. A. Liehterman, Phar.D.....	845
New York State, Projection of Public Health Engineering in. W. H. Larkin, C.E.....	1285
New York World's Fair, 1939. An American Museum of Health. Editorial.....	771
Newer Knowledge of Poliomyelitis. Editorial.....	776
News from the Field (and Fillers):.....	110, 229, 414, 548, 682, 800, 900, 1020, 1147, 1260, 1365, 1451
Alabama Counties.....	900
Alabama Health District.....	901
Alaska, Pasteurized Milk in.....	1148
Alger, Dr. Ellice M.—Leslie Dana Medal.....	1262
Allocation of Deaths.....	27
American Social Hygiene Association Meeting.....	232
American Verbosity.....	475
Animal and Human Diseases.....	166
Anti-Syphilis Committee.....	518
Arkansas Employs Dentists.....	1453
Association of Women in Public Health Plan All-Day Meeting for October 24.....	1021
Belgian Health Services, Survey of.....	1169
Better Care for Mothers and Babies.....	229
Beware of Hollandaise Sauce.....	722
Biological Abstracts for 1939, A New Form of.....	1451
Birth Registration Circular.....	686
Birth Registration Pamphlet.....	1148
Blood Donors Bureau, Volunteer.....	1365
Brazil, Yellow Fever in.....	1216
British Maternal and Infant Mortality.....	1262
Brooklyn Maternity Care.....	1147
Business of Thinking, The.....	450
Cairo Leprosy Conference.....	540
California, Changes in.....	689
Canada, Medical Research in.....	1221
Canadian Public Health Association Adopts Standard Methods.....	416
Canadian Public Health Association, Christmas Meeting of.....	1452
Canadian Public Health Association Meeting.....	115
Carbolized Vaccine for Animal Bites.....	735
Carter, Henry Rose, Memorial Laboratory, The.....	548
Cemeteries or Playing Fields?.....	156
Chicago Tumor Institute.....	687
Chili Honors Dr. Geiger.....	232
Cogswell, Dr., Honored.....	415
College Survey of Health.....	745
Colorado Public Health Association.....	550, 901
Conference of State and Provincial Health Authorities Elects New Officers.....	687
Conference on Maternal and Child Welfare.....	111
Conferences and Dates.....	114, 229, 420, 555, 691, 804, 905, 1027, 1152, 1267, 1368, 1457
Connecticut Crippled Children Program.....	232
Connecticut Public Health Association.....	902
Consumers Order Use of Sanitary Utensils.....	901
Contact.....	302
"Coöperative Health".....	549
Courses in Education of the Handicapped.....	235
Courses in Public Health, Summer School.....	682
Courses in Syphilis.....	231
Cuba, Tuberculosis Campaign in.....	550
Deadliest Drivers Are Boys.....	414
Death Certificates for New York.....	687
Delaware River Pollution Control.....	1263
Delta Omega Officers.....	1451
Dentists, Arkansas Employs.....	1453
Dentists, Public Health Course for.....	1451
Drainage Base Problems: National Resources Committee Reports.....	1453
Drug Addicts, Hospital for.....	1452
Dye Preparation (Lash Lure).....	232
Eating Places, Score Cards for.....	161
Economic Losses in Preventable Disease (Dr. Parran's address).....	235
Fatal Accidents in 1937.....	242
"Federal Money Is Not Manna from Heaven" (Edward S. Godfrey, Jr., M.D.).....	1047
Florida Public Health Association Elects Officers.....	112
French Institute for the Prevention of Occupational Diseases.....	688
Geiger, Dr.—Chili Honors.....	232
Georgia County Units.....	551
Health Officers Honored (State and Provincial Health Authorities of North America).....	688
Heart Disease Leads in Insurance Claims.....	551

News from the Field (and Fillers)—Continued	Page
Hospital for Drug Addicts.....	1452
Housing Survey	758
Illinois Health Officers.....	902
Illinois to Standardize Laboratory Procedures.....	689
Indian Service Ceremonies.....	550
Indiana's Industrial Survey.....	1148
Indiana's New Health Units Permanent.....	234
Industrial Hygiene and Toxicology Course (University of Pittsburgh).....	230
Industrial Physicians Meeting.....	552
Inspection of Diagnostic Laboratories.....	548
International Health Broadcast	550
International Nomenclature of Diseases.....	1261
International Nursing Scholarships.....	753
January 1938 Journal Needed.....	1454
Jenner, Edward, Memorabilia.....	915
Kansas County Health Officers.....	688, 1022
Keeping Well	292
Kiwanis Health Service	233
"Lash Lure" (Dye Preparations).....	232
LaWall, Charles Herbert (Death).....	235
League Committee on Health Indices.....	1261
Legislative Enactments in the Province of Ontario.....	717
Length of Life.....	817
Leslie Dana Medal Awarded Dr. Ellice M. Alger.....	1262
Louisiana Oyster Ruling	689
Loyola University, New Department in.....	1365
Mallon, Mary. "Typhoid Mary" Dies of Stroke at 68.....	1451
Marrying a Nurse.....	1141
Maryland Summer Camps	416
Medical Writing	705
Mendel Medal Awarded Dr. Parran.....	802
Mental Hygiene Symposium.....	1147
Metabolized Vitamin D Milk.....	233
Mexico, New Director of Public Health in.....	231
Michigan Blood Tests.....	689
Michigan Bureau of Public Health Nurses.....	1453
Michigan, Communicable Disease Control in.....	1148
Michigan Doctors Become Mayors.....	1149
Michigan Public Health Association Elects Officers.....	113, 1452
Military Surgeons Meeting.....	233
Mississippi Health Library.....	552
Mississippi Valley Medical Society 1939 Essay Award.....	1453
Missouri Public Health Association.....	1023
Mobilization for Human Needs.....	231
Model Ordinances	414
National Association of Sanitariums.....	232
National Foundation for Infantile Paralysis.....	13
National Health Conference.....	687, 900
National Health Council Officers.....	552
National Health Survey.....	192
National Negro Health Week.....	550
National Organization for Public Health Nursing—Records Handbook.....	6
National Resources Committee Reports (drainage base problems).....	1453
Negro Students' Tuberculosis Study.....	234
New Hampshire Occupational Diseases Study.....	1148
New Haven Housing Authority.....	1147
New Jersey and New York Premarital Examinations for Syphilis.....	900
New Jersey Health Association.....	113
New Jersey Health Legislation.....	834
New Mexico Public Health Association Elects Officers.....	112
New York and New Jersey Premarital Examinations for Syphilis.....	900
New York City, Coordination in.....	1023
New York City, Public Health Association of.....	902
New York Health Department Nursing in 1937.....	417
New York Society of Tropical Medicine.....	1262
New York State Department of Health, Changes in.....	1454
New York State Health Officers Association.....	1149
N.O.P.H.N. Institutes	549
North Carolina Pneumonia Commission.....	689
North Carolina Syphilis Campaign.....	416
Northern California Public Health Association Elects New Officers.....	552
Nurses' Biennial Convention.....	417
Nursing Information Bureau	1365
Nursing Service Honored	729
Nutrition	478
Oberlaender Trust, The—Visual Education.....	1113

News from the Field (and Fillers)—Continued	Page
Obstetrics and Pediatrics Courses.....	800
Ohio Federation Officers	1022
Ohio Venereal Disease Program.....	1260
On Being a Good Egg.....	505
Ontario Pasteurization Law.....	1149
Order of Merit Awards.....	234
Pan American Sanitary Conference, Tenth.....	900
Parents' Magazine Awards.....	417
Parran, Dr.—Mendel Medal Awarded.....	802
Parrots Barred in New York.....	1023
Pasadena Malnutrition Study.....	1147
Patients, Not Diseases, Are Treated.....	255
Pennsylvania Cancer Clinics	1149
Pennsylvania Public Health Association Elects Officers.....	112
Personal Gifts Needed by Physicians.....	1079
Personals.....113, 236, 417, 552, 689, 802, 903, 1024, 1149, 1262, 1366	1455
Physical Education Associations Merge.....	801
Pneumonia Advisory Committee.....	112
Pneumonia Film	112
Pneumonia Sera	549
Pneumonia Serum for Baltimore Indigents.....	1454
Pneumonia Service in New York.....	26
Preventive Medicine	1161
Proposed Tuberculosis Program.....	1021
Protest of Massachusetts Public Health Association.....	1201
Psittacosis Ordinances in Baltimore.....	1454
Public Health and Social Security.....	1260
Public Health Association of New York City.....	902
Public Health Course for Dentists.....	1454
Public Health Fellowship for Women.....	1365
Public Health Nurse Placement.....	1023
Public Health Nursing in 1937, More.....	1453
Puerperal Sepsis and Its Prevention.....	122
Qualifications for City Health Officers.....	110
Qualifications for Municipal Health Officers.....	111
Records Handbook (N.O.P.H.N.).....	6
Red Cross Nursing Services Under One Head.....	1262
Regional Laboratories	416
Rheumatism	1038
Rhode Island Association Officers.....	233
Ross, Grace, Nursing Director Honored.....	801
Rural Health Services	420
Safety Campaign	232
Safety Education	901
Schick, Dr.—Medal Awarded.....	551
Score Cards for Eating Places	161
Shellfish Area Condemned (New Hampshire).....	1148
Shellfish Control (California State Department of Health).....	1022
Sioux Sanatorium Opened (Rapid City, S. C.).....	1184
Skin Irritants Report Available. Report (1926-1934) by Henry Field Smyth, M.D., Dr.P.H.	234
Social Hygiene Meeting	232
South Carolina Public Health Association.....	902
South Carolina Public Health Association Meeting.....	801
Southern Branch A.P.H.A. Elects Officers.....	113
Southern California Public Health Association Elects New Officers.....	532
Southern Medical Association	1454
State Conference of Public Health.....	1454
Stream Pollution, Prevention.....	928
Stream Pollution Study (Cincinnati).....	1023
Study of Municipal Abattoirs.....	800
Summer School Courses in Public Health.....	682
Sylvatic Plague Laboratory.....	1453
Syphilis Courses	686
Syphilis Meeting (Hot Springs National Park, Ark.).....	943
Syphilis, New Jersey and New York Premarital Examinations for.....	900
Taxpayer and Public Health, The.....	43
Tennessee Opens Health Unit Building.....	1232
Texas Public Health Association Elects Officers.....	1452
Texas, Public Health Courses In.....	1174
Tobacco, Alcohol, and Longevity.....	824
Traffic Safety Training (University of Michigan).....	901
Transactions of the Congress on Hygiene.....	415
Trichinosis in the United States, Prevalence of.....	579
Tuberculosis Campaign in Cuba.....	559
Tuberculosis Program, Proposed.....	1021
Tuberculosis Ruling	414

	Page
News from the Field (and Fillers)—Continued	
"Typhoid Mary" [Mary Mallon] Dies of Stroke at 68.....	1451
Typhus Animals, New.....	1452
United States Conference of Mayors.....	110
University of Illinois Building Ready.....	233
University of Minnesota In-Service Fellowships in Public Administration.....	414
Venereal Disease Control Allotments.....	1260
Venereal Disease Control Bill Passes Congress.....	800
Venereal Disease Course	415
Veterinarians Tour	689
Virginia Announces Free Anti-Syphilis Drugs.....	1452
Virginia Health Unit	1023
Virginia—Venereal Disease Control in.....	1022
Visual Education—The Oberlaender Trust.....	1113
Volatile Solvents, Bibliography on. Report (1934-1936) by Henry Field Smyth, M.D., Dr.P.H., announced available	234
Water Plant Manual.....	234
West Virginia Public Health Association Elects Officers.....	1452
Western Branch A.P.H.A.....	687
Western Branch Committee on Milk Control.....	800
Whooping Cough Most Intractable of Childhood Diseases.....	838
Wisconsin Appointments	688
Yellow Fever in Brazil.....	1216
Y.M.C.A. Syphilis Campaign.....	112
 "Nineteen Thirty-Seven a Star Health Year." Metropolitan Life Insurance Company Report. Editorial	510
Nomenclature of disease. See A Tabular Outline for Use in Reporting Hospital Morbidity.	
Joseph Berkson, M.D.....	723
Nordstrom, Alfred, and Turner, C. E., Dr.P.H., Sc.D. Extent and Seasonal Variation of Intermittency in Growth.....	499
Norton, John F., Ph.D., Chairman. Water Analysis. Report on Examination of Water and Sewage (Standard Methods).....	Year Book, 118
Nuisances, Control of. Edward Wright.....	579
Nurse in the Control of Syphilis and Gonorrhea, The Role of the. Gladys L. Crain, R.N... ..	181
Nurse, Public Health—and Orthopedic Nursing Care, The. Dorothy J. Carter, R.N.....	458
Nurse to Meet Community Needs in Public Health, Preparing the. Marion G. Howell, R.N., M.Sc.	566
Nurses Against Scarlet Fever, Result of Active Immunization of. Edwin H. Place, M.D....	137
Nursing. See Public Health Nursing.	
Nursing, Public Health. See Public Health Nursing Section.	
Nursing, What Every Health Officer Should Know About Public Health. Naomi Deutsch, R.N.	1087
Nutrition. See Diet.	
Nutrition and Dental Caries. Bion R. East, D.D.S.....	72
Nutrition, Present Status of Dental Caries in Relation to. Nina Simmonds, Sc.D.....	1381
Nutrition Program in a State Health Department. Woodbridge E. Morris, M.D.....	718
Nutrition Services in Maternal and Child Health Programs Under the Social Security Act. Marjorie M. Heseltine.....	815
Nutritional Education in the Home. Dutchess County, N. Y., Project. Bertrand E. Roberts, M.D.	944
Nutritional Influence on Teeth. Frances Krasnow, Ph.D.....	325
Nutritional Problems, Committee on. Extent of Vitamin Deficiency in the United States. D. Breese Jones, Ph.D., Chairman.....	Year Book, 75
Nutritional Status, Estimates of. Comment on "Public Health Reports" paper. Editorial	871
Nutritionist in a City Public Health Program, The. Sophia S. Halsted.....	849
Nyswander, Dorothy B., Ph.D. Practical Procedures in School Health Service.....	334
 Oberlaender Trust, The—Visual Education.....	1113
Oberwager, John, M.D. Supervision of Fumigation and Extermination.....	633
Occupational diseases. See Industrial hygiene.	
Opportunities and Responsibilities of the Health Officer in Connection with the Federal....	
Acts. C.-E. A. Winslow, Dr.P.H.	1269
Opportunity for Health, An Equal. The Honorable Herbert H. Lehman.....	1
Oral hygiene. See Dentistry.	
Organisms Involved in the Pollution of Water from Long Stored Feeces. Leland W. Parr, Ph.D.	445
Oriental pilgrimages, Effect of sanitation on. A Contrast—editorial.....	874
Orthopedic Nursing Care, The Public Health Nurse and. Dorothy J. Carter, R.N.....	458
Our Sixty-Seventh Annual Meeting [Kansas City, Mo., October 25-28, 1938]. Editorial.....	1420
Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis. Roy F. Feemster, M.D., Dr.P.H.....	1403
Oysters. See Shellfish.	

P

	Page
Palmer, Carroll E., M.D. The Dark Adaptation Test for Vitamin A Deficiency.....	309
Pan American Sanitary Bureau. See Development of International Coöperation Among the Health Authorities of the American Republics. Hugh S. Cumming, M.D.....	1193
Paper Board for Bacteriological Examination, Disintegration of. J. R. Sanborn.....	576
Paper Containers, Microbial Flora of. Fred W. Tanner.....	587
Paper food containers. See Development of Standard Methods for the Microbiological Examination of Foods. Report of the Committee on Microbiological Methods of Food Examination. Lawrence H. James, Ph.D., Chairman.....	Year Book, 56
Paper Wrappers and Containers for Foods, Suitable. J. R. Sanborn.....	571
Parkhurst, Elizabeth. Allocation of Deaths—comment reprinted from <i>Medical Officer</i> (London) on article by Elizabeth Parkhurst, <i>Journal</i> , July, 1937.....	27
Parr, Leland W., Ph.D. Organisms Involved in the Pollution of Water from Long Stored Feces	445
Parran, Thomas, M.D., Dr.P.H.:	
Health of the Nation, The.....	1376
Relationship of Maternal and Child Health to the General Health Program.....	250
Pasteurella pestis: See—	
Fleas as Vectors of Plague. C. R. Eskey, M.D.....	1305
Sylvatic Plague. K. F. Meyer, Ph.D., M.D.....	1153
Pasteurization of Eating Utensils—Use of Dishwashing Machines. Wesley C. Cox, M.D....	174
Pasteurization, Practical Experience with the Scherer Rapid Field Test for. D. M. Roger.....	1325
Pasteurization, Present Status of Phosphatase Test for. Walter von Dohlen Tiedeman, M.C.E. (Followed by Discussions, by Paul F. Krueger and Sol Pineus, C.E.).....	316
Pasteurized Milk, Formate Richoleate and Brilliant Green Bile Broths to Detect Coliform Organisms in. I. C. Gunsalus and C. N. Stark.....	832
Pasteurized Milk, Improved Laboratory Control of. Walter von D. Tiedeman, M.C.E., and Nelson J. Hohlß, M.S.....	629
Pasteurized Milk, Raw or? Editorial.....	1424
Patent Medicines and Advertisers. Editorial.....	1332
Pathological and Immunological Studies in Poliomyelitis—And Their Significance in Therapy and Treatment. Maurice Brodie, M.D.....	746
Patterson, Raymond S., Ph.D. A Selected Public Health Bibliography With Annotations.. 104, 222, 405, 540, 667, 793, 890, 1011, 1137, 1247, 1355, 1438	
Pediatrics, Postgraduate Education of Physicians in. Myron E. Wegman, M.D.....	1072
Pennell, Elliott H., and Mountin, Joseph W., M.D. Tenure of Office for Health Officers....	1311
Personals	113, 236, 417, 552, 689, 802, 903, 1024, 1149, 1262, 1366, 1455
Personnel, Politics in the Selection of Health Department—Is There a Remedy? William Parr Capes	835
Phair, John T., M.D., D.P.H. A More Effective School Health Program.....	1039
Pharmacopoeia of the United States—translation into Spanish. See Development of International Coöperation Among the Health Authorities of the American Republics. Hugh S. Cumming, M.D.	1193
Pharris, Crit, M.D., Kittrell, F. W., and Williams, W. C., M.D. A Water-Borne Outbreak of Gastroenteritis in a Tennessee Town.....	736
Phosphatase Test. See Practical Experience with the Scherer Rapid Field Test for Pasteurization. D. M. Roger.....	1325
Phosphatase Test for Pasteurization, Present Status of. Walter von Dohlen Tiedeman, M.C.E. (Followed by Discussions, by Paul F. Krueger and Sol Pineus, C.E.).....	316
Phosphatase Test, The. See Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman.....	Year Book, 66
Photometer. See The Dark Adaptation Test for Vitamin A Deficiency. Carroll E. Palmer, M.D.	309
Physicians' Salaries. See Positions and Rates of Pay in Public Health Agencies. Anthony J. Borowski, Dr.P.H.	1197
Physician's Statement of Cause of Death, The. A Hardisty Sellers, M.D., D.P.H.....	430
Physique and Health. Jesse Peirring Williams, M.D.....	457
Pigs. See Pork.	
Pillmer, L., Ph.D., and Ecker, Enrique E., Ph.D. An Inexpensive Method for the Dehydration and Preservation of Complement and Other Biological Materials.....	1231
Pineus, Sol, C.E. Discussion, following "Present Status of Phosphatase Test for Pasteurization," by Walter von Dohlen Tiedeman, M.C.E.....	322
Pittsburgh, Pa. See Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia. Samuel R. Haythorn, M.D., and Harry B. Meller.....	479
Place, Edwin H., M.D. Result of Active Immunization of Nurses Against Scarlet Fever....	137
Plague, Fleas as Vectors of. C. R. Eskey, M.D.....	1305
Plague, Sylvatic. K. F. Meyer, Ph.D., M.D.....	1153
Plumbing in Low Cost Housing. Joel I. Connolly.....	954
Pneumococcal Type Determination, Difficulties Encountered in. Annabel W. Walter.....	54
Pneumococcus Epidemic at the State Hospital at Worcester, Mass., A Study of a Type I. W. G. Smillie, M.D., G. H. Warnock, M.D., and Harold J. White.....	293
Pneumococcus Types Associated with Pneumonia, Recognition of. Report of the Standard Methods Committee. Elliott S. Robinson, M.D., Ph.D., Referee.....	Year Book, 108
Pneumoconiosis. See Lung Findings in Foundry Workers—A Four Year Survey. O. A. Sander, M.D.	601

	Page
Pneumonia, Necropsy Evidences on the Relation of Smoky Atmosphere to. Samuel R. Haythorn, M.D., and Harry B. Meller.....	479
Pneumonia, Recognition of Pneumococcus Types Associated with. Report of the Standard Methods Committee. Elliott S. Robinson, M.D., Ph.D., Referee.....	108
Poindexter, Hildris A., M.D. Handicaps in the Normal Growth and Development of Rural Negro Children	1048
Poison Gas, Protection Against. Editorial.....	379
Poliomyelitis. See:	
Preventive Aspects of Crippling Diseases. H. E. Hilleboe, M.D.....	451
The Public Health Nurse and Orthopedic Nursing Care. Dorothy J. Carter, R.N.....	458
Poliomyelitis, Chemoprophylaxis in. Editorial.....	376
Poliomyelitis, Newer Knowledge of. Editorial.....	776
Poliomyelitis, Pathological and Immunological Studies in—And Their Significance in Therapy and Treatment. Maurice Brodie, M.D.....	746
Politics in the Selection of Health Department Personnel—Is There a Remedy? William Parr Capes	835
Pollution of Water from Long Stored Feces, Organisms Involved in the. Leland W. Parr, Ph.D.	445
Poor Law, in England. See The Case of Public Health vs. Public Welfare. Homer Folks, LL.D.	916
Population Growth—Its Vital Statistics and Public Health Aspects. Warren S. Thompson..	1319
Population in Intracensal and Postcensal Years by Means of Continuous Population Registers, Determining. Dorothy Swaine Thomas, Ph.D.....	28
Populations, Methods of Estimating Postcensal. Henry S. Shryock, Jr., Ph.D.....	1042
Pork Food Products. See:	
The Epidemiology of Trichinosis. C. D. Barrett, M.D., and Richard Sears, M.D.....	706
Trichinellosis in San Francisco. M. Hobmaier, M.D., and J. C. Geiger, M.D.....	1203
Positions and Rates of Pay in Public Health Agencies. Anthony J. Borowski, Dr.P.H.....	1197
Postcensal Populations, Methods of Estimating. Henry S. Shryock, Jr., Ph.D.....	1042
Postgraduate Education of Physicians in Pediatrics. Myron E. Wegman, M.D.....	1072
P. pestis. See:	
Fleas as Vectors of Plague. C. R. Eskey, M.D.....	1305
Sylvatic Plague. K. F. Meyer, Ph.D., M.D.....	1153
Practical Experience with the Scharer Rapid Field Test for Pasteurization. D. M. Roger..	1325
Practical Procedures in School Health Service. Dorothy B. Nyswander, Ph.D.....	334
Precision Methods in the Determination of the Heavy Metals. Lawrence T. Fairhall, Ph.D.	825
Preliminary Program: Sixty Seventh Annual Meeting, Kansas City, Mo., October 25-28, 1938	965
Addition	1251
Preparing the Nurse to Meet Community Needs in Public Health. Marion G. Howell, R.N., M.Sc.	566
Present Status of Dental Caries in Relation to Nutrition. Nina Simmonds, Sc.D.....	1381
Present Status of Phosphatase Test for Pasteurization. Walter von Dohlen Tiedeman, M.C.E. (Followed by Discussions, by Paul F. Krueger and Sol Pincus, C.E.).....	316
Present Status of Safety Education in Some Representative School Systems. John P. Sullivan, Ph.D.	1175
Present Status of Vitamin Milks. E. V. McCollum, Ph.D.....	1069
Presidential Address. A Century in Arrears. Abel Wolman, Dr.Eng.....	1369
Presidents of the American Public Health Association, Past.....	Year Book, 11
Preventive Aspects of Crippling Diseases. H. E. Hilleboe, M.D.....	451
Primate in Laboratories and Zoölogical Collections, Acquired Tuberculosis in the. C. R. Schroeder, D.V.M.	469
Probable Typhoid Carrier Incidence in Mississippi, The. A. L. Gray, M.D., M.P.H.....	1415
Problem of the Causes of Stillbirth. Ethel C. Dunham, M.D., Elizabeth C. Tandy, D.Sc., Edwin F. Daily, M.D., and Clara E. Hayes, M.D.....	491
Problems of a Housing Enforcement Program. Memphis, Tenn. L. M. Graves, M.D., and Alfred H. Fletcher	695
Professional Education, Committee on. Public Health Degrees and Certificates Granted in 1937. W. S. Leathers, M.D., Chairman.....	863
Progress in and Present Status of Biologic Products. Report of the Committee. Elliott S. Robinson, M.D., Ph.D., Chairman.....	93
Progress Under the Operation of Title VI of the Social Security Act. C. E. Waller, M.D....	1298
Projection of Public Health Engineering in New York State. W. H. Larkin, C.E.....	1285
Protection Against Poison Gas. Editorial.....	379
Public Health Agencies, Positions and Rates of Pay in. Anthony J. Borowski, Dr.P.H....	1197
Public Health Aspects of Housing, Some. Editorial.....	776
Public Health Bibliography With Annotations, A Selected. Raymond S. Patterson, Ph.D....	104, 222, 405, 546, 667, 793, 890, 1011, 1137, 1247, 1355, 1438
Public Health Degrees and Certificates Granted in 1937. W. S. Leathers, M.D., Chairman....	863
Public Health Dentistry: Report of the Committee. Guy S. Millberry, D.D.S., Chairman..	Year Book, 44
Public Health Education Section. Evert G. Routzahn, Associate Editor...80, 201, 382, 512, 652, 777, 876, 998, 1121, 1338, 1426	
Public Health Education Section, A.P.H.A. Carl Wilzbach, M.D., Secretary.	
Public Health Engineering in New York State, Projection of. W. H. Larkin, C.E.....	1285

	Page
Public Health Engineering Section, A.P.H.A. James Lloyd Barron, C.E., Secretary.	
Public Health Expanding. Editorial.....	103
Public Health Laboratories as Carried on in Connecticut, Registration and Approval of.	
Friend Lee Mickle, Se.D.	1185
Public Health Laws, Modernization of. See "It Can't Be Done Under Our Law."	
Editorial	508
Public Health Nurse. See:	
Nutritional Education in the Home: Dutchess County, N. Y., Project. Bertrand E.	
Roberts, M.D.	944
The Role of the Nurse in the Control of Syphilis and Gonorrhea. Gladys L. Crain,	
R.N.	181
Public Health Nurse and Orthopedic Nursing Care, The. Dorothy J. Carter, R.N.....	458
Public Health Nurses' Salaries. See Positions and Rates of Pay in Public Health	
Agencies. Anthony J. Borowski, Dr.P.H.....	1197
Public Health Nursing. See Preparing the Nurse to Meet Community Needs in Public	
Health. Marion G. Howell, R.N.....	566
Public Health Nursing Agencies, To Study Relationships Between Official and Nonofficial.	
Report of the Committee. Miriam Ames, R.N., Chairman.....	Year Book, 157
Public Health Nursing Section, A.P.H.A. Ruth Houlton, R.N., Secretary.	
Public Health Nursing, What Every Health Officer Should Know About. Naomi Deutsch,	
R.N.	1087
"Public Health Reports" paper, comment on. Estimates of Nutritional Status. Editorial	
Public Health vs. Public Welfare, The Case of. Homer Folks, LL.D.....	871
Public Welfare, The Case of Public Health vs. Homer Folks, LL.D.....	916
Publications, American Public Health Association.....	Year Book, 12
Puerperal Septicemia. See Abortion and Public Health. Regine K. Stix, M.D., and	
Dorothy G. Wiehl.....	621
Pulley, H. C., and Fleisher, Moyer S. Schick Reactions in Students of Medicine.....	854

Q

Qualifications and Preparation of Health Officers, Certain Criteria in the. Henry E.	
Meleney, M.D.	423
Qualifications for Health Department Personnel. See Politics in the Selection of Health	
Department Personnel—Is There a Remedy? William Parr Capes.....	835
Qualifications for Public Health Nursing. See Preparing the Nurse to Meet Community	
Needs in Public Health. Marion G. Howell, R.N., M.Sc.....	566
Qualifications of a Venereal Disease Control Officer. Thomas B. Turner, M.D.....	539
Qualifications of Sub-Professional Field Personnel in Sanitation, Educational. Progress	
Report of the Committee on Professional Education. W. S. Leathers, M.D., Chairman..	1233

R

Rabies. See Experiments on Antirabic Vaccination With Tissue Culture Virns. Leslie T.	
Webster, M.D.	44
Rabies in Animals, Comparative Methods of Diagnosis of. Charles N. Leach, M.D.....	162
Rats. See Rodent.	
Ravenel, Mazzyck P., M.D. Editor, American Journal of Public Health.	
Raw or Pasteurized Milk? Editorial.....	1424
Recognition and Significance of Hemolytic Streptococci in Infectious Diseases. Report of	
the Standard Methods Committee. Evaluation of the Group-Precipitation Test in the	
Identification of Hemolytic Streptococci Pathogenic for Man. Julia M. Coffey, Referee..	
Year Book,	104
Recognition for Extended Membership—American Public Health Association.....	Year Book, 11
Recognition of Pneumococcus Types Associated With Pneumonia. Report of the Standard	
Methods Committee. Elliott S. Robinson, M.D., Ph.D., Referee.....	Year Book, 108
Registration and Approval of Public Health Laboratories as Carried on in Connecticut.	
Friend Lee Mickle, Se.D.	1185
Relation of Lymphocytic Choriomeningitis to Acute Aseptic Meningitis (Wallgren). R. D.	
Baird, M.D., and Thomas M. Rivers, M.D., Se.D.....	47
Relationship of Maternal and Child Health to the General Health Program. Thomas	
Parran, M.D.	256
Reports:	
Skin Irritants Report Available. Report (1926-1934) by Henry Field Smyth, M.D.,	
Dr.P.H.	234
Volatile Solvents, Bibliography on. Report (1934-1936) by Henry Field Smyth, M.D.,	
Dr.P.H., announced available	234
Reports of Committees. See Committee, Report of.	
Resazurin Test. See Milk and Dairy Products. Report of the Committee. Frederick W.	
Fabian, Ph.D., Chairman	Year Book, 66
Resolutions Adopted by the Governing Council, American Public Health Association,	
October 7, 1937	Year Book, 33
Resolutions of the A.P.H.A. Passed at Kansas City, October, 1938.....	1441

	Page
Restaurants. See Administrative Control of Food Handlers and Places Dispensing Food and Drinks (Hartford, Conn.). Katherine Marden, Joseph M. Curry, D.V.S., Louis J. Horowitz, and Benjamin G. Horning, M.D.....	1277
Result of Active Immunization of Nurses Against Scarlet Fever. Edwin H. Place, M.D....	137
Revised Fuchsin Lactose Broth for the Confirmatory Test in Water Analysis. Cassandra Ritter	616
Rheumatic Fever. See Heart Disease in Childhood. T. Duckett Jones.....	637
Rheumatic Heart Disease. See Contributions of Edward Jenner to Modern Concepts of Heart Disease. O. F. Hedley, M.D.....	1165
Rickets. See Present Status of Vitamin Milks. E. V. McCollum, Ph.D.....	1069
Riley, R. H., M.D., Dr.P.H. The Health Department in the Field of Medicine.....	203
Ritter, Cassandra. Revised Fuchsin Lactose Broth for the Confirmatory Test in Water Analysis	616
Rivers, Thomas M., M.D., Sc.D., and Baird, R. D., M.D. Relation of Lymphocytic Choriomeningitis to Acute Aseptic Meningitis (Wallgren).....	47
Roberts, Bertrand E., M.D. Nutritional Education in the Home. Dutchess County, N. Y., Project	944
Robinson, Elliott S., M.D., Ph.D., Chairman. Progress in and Present Status of Biologic Products. Report of the Committee.....Year Book,	93
Robinson, Elliott S., M.D., Ph.D. Report of the Referee on Recognition of Pneumococcus Types Associated With Pneumonia (Standard Methods).....Year Book,	108
Roche, Josephine. See Letter to the Editor, from Arthur T. McCormack, M.D.....	380
Rodent Plague. See:	
Fleas as Vectors of Plague. C. R. Eskey, M.D.....	1305
Sylvatic Plague. K. F. Meyer, Ph.D., M.D.....	1153
Roger, D. M. Practical Experience With the Scharer Rapid Field Test for Pasteurization...:	1325
Rocky Mountain Spotted Fever and Tick Survey in Iowa. Carl F. Jordan, M.D., C.P.H....	1411
Rôle of the Nurse in the Control of Syphilis and Gonorrhea, The. Gladys L. Crain, R.N....	181
Routzahn, Evart G. Associate Editor, Public Health Education Section....80, 201, 382, 512, 652, 777, 876, 998, 1121, 1338,	1426
Rural Negro Children, Handicaps in the Normal Growth and Development of. Hildrus A. Poindexter, M.D.	1048
Rural Syphilis—A Localized Outbreak. Monroe County, Tenn. R. C. Kimbrough, M.D., D. M. Cowgill, M.D., and E. P. Bowerman, M.D.....	756
S	
Safe Milk for England? Editorial.....	647
Safety Education in Some Representative School Systems, Present Status of. John P. Sullivan, Ph.D.	1175
St. Louis University School of Medicine. See Schick Reactions in Students of Medicine. H. C. Pulley and Moyer S. Fleisher.....	854
Salad Contaminated by a Chronic Typhoid Carrier, An Epidemic of Typhoid Fever Attributed to. Paul A. Lembcke, M.D., and Paul von Haeseler, M.D.....	1212
Salaries. See Positions and Rates of Pay in Public Health Agencies. Anthony J. Borowski, Dr.P.H.	1197
Sanborn, J. R.:	
Disintegration of Paper Board for Bacteriological Examination.....	576
Suitable Paper Wrappers and Containers for Foods.....	571
Sander, O. A., M.D. Lung Findings in Foundry Workers—A Four Year Survey.....	601
San Francisco, Trichinellosis in. M. Hobmaier, M.D., and J. C. Geiger, M.D.....	1203
Sanitary Aspects of Air Conditioning. C. P. Yaglou. (Correction, page 546).....	143
Sanitary Study of Commercial Laundry Practices, A. Lloyd Arnold, M.D.....	839
Sanitation, Educational Qualifications of Sub-Professional Field Personnel in. Progress Report of the Committee on Professional Education. W. S. Leathers, M.D., Chairman..	1233
Sanitation in the Next War. Editorial.....	374
Sanitation Measures, Federal Facilities to Expedite Emergency. R. E. Tarbett. (Followed by Discussion, by J. K. Hoskins, C.E.).....	1091
Sargent, Cleland A., M.D., and Clark, William T., M.D. Investigation of Early Syphilis. Buffalo, N. Y.	807
Sayers, R. R., M.D. Syphilis Control in Industry.....	155
Scarlet Fever. See the Familial Aggregation of Infectious Diseases. Wade H. Frost, M.D....	7
Scarlet Fever Control. Edward R. Krumbiegel, M.D.....	1096
Scarlet Fever Immunization With Formalinized Toxin. A Preliminary Report. Gaylord W. Anderson, M.D.	123
Scarlet Fever, Result of Active Immunization of Nurses Against. Edwin H. Place, M.D....	137
Scharer Rapid Field Test for Pasteurization, Practical Experience With the. D. M. Roger..	1325
Schick Reactions in Students of Medicine. H. C. Pulley and Moyer S. Fleisher.....	854
Schick Test. See Alum Precipitated Toxoid for the Prevention of Diphtheria. Archibald S. Dean, M.D., Dr.P.H., and Samuel Hyman, M.D.....	1170
School Health Program, A More Effective. John T. Phair, M.D., D.P.H.....	1059
School Health Service. Report of the Committee. Harold H. Mitchell, M.D., Chairman..	47
Year Book,	47
School Health Service, Practical Procedures in. Dorothy B. Nyswander, Ph.D.....	334

	Page
School Systems, Present Status of Safety Education in Some Representative. John P. Sullivan, Ph.D.	1177
Schools, Visual Education for. Pauline Brooks Williamson.	27
Schroeder, C. R., D.V.M. Acquired Tuberculosis in the Primate in Laboratories and Zoölogical Collections	461
Schulze, Wilmer H., Ph.D. Industrial Hygiene Applied to the Clothing Industry.	476
Schwartz, Louis, M.D. Diagnosis of Industrial Skin Diseases.	593
Scientific Exhibits. Report of the Committee. Homer N. Calver, Chairman.	Year Book, 42
Scott, Warren J., Chairman. Bathing Places. Report of the Joint Committee.	Year Book, 119
S. dysenteriae. See The Acute Diarrheal Disorders. A. V. Hardy, M.D., Dr.P.H., and James Watt, M.D.	730
Sea Water, Chloramine Treatment of. Lewis V. Carpenter, Lloyd R. Setter, and Morris Weinberg	929
Senns, Richard, M.D., and Barrett, C.D., M.D. The Epidemiology of Trichinosis.	706
Section Councils, American Public Health Association.	Year Book, 13
Sedgwick Memorial Medal, Recipients of the.	Year Book, 11
Selby, Clarence D., M.D. Health Maintenance in Industry.	1325
Sellers, A. Hardisty, M.D., D.P.H. The Physician's Statement of Cause of Death.	430
Serodiagnostics of Syphilis. Editorial.	375
Serological and Bacteriological Procedures in the Diagnosis of Enteric Fevers. Report of the Standard Methods Committee. Marlon B. Coleman, Referee.	Year Book, 111
Serological Tests for the Diagnosis of Syphilis. Report of the Standard Methods Committee. Ruth Gilbert, M.D., Referee.	Year Book, 112
Serological Tests for the Diagnosis of Syphilis. Report of the Standard Methods Committee. Elizabeth Maltaner, Associate Referee.	Year Book, 114
Setter, Lloyd R., Weinberg, Morris, and Carpenter, Lewis V. Chloramine Treatment of Sea Water	929
Sewage Treatment Plant Processes, Survival of E. Typhi in. Carl E. Green and Paul J. Beard, Ph.D.	762
Shellfish. Progress Report of the Committee. L. M. Fisher, D.P.H., Chairman.	Year Book, 126
Shrader, J. H., Ph.D., M.D., Food and Nutrition Chairman. Analyzing Frozen Desserts and Ingredients. Report of the Joint Standard Methods Committee.	Year Book, 49
Shryock, Henry S., Jr., Ph.D. Methods of Estimating Postcensal Populations.	1042
Silicosis. See Lung Findings in Foundry Workers—A Four Year Survey. O. A. Sauder, M.D.	601
Simmonds, Niun, Sc.D. Present Status of Dental Caries in Relation to Nutrition.	1381
Sixty-Seventh Annual Meeting, Our [Kansas City, Mo., October 25-28, 1938]. Editorial.	1420
Sixty-Seventh Annual Meeting, The [Kansas City]. Editorial.	1234
Skin Diseases, Diagnosis of Industrial. Louis Schwartz, M.D.	593
Skin Irritants Report Available. Report (1926-1934) by Henry Field Smyth, M.D., Dr.P.H.	234
Smillie, W. G., M.D., Wmnoek, G. H., M.D., and White, Harold J. A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass.	293
Smoky Atmosphere to Pneumonia Necropsy Evidences on the Relation of. Samuel R. Haythorn, M.D., and Harry B. Meller.	479
Smyth, Henry Field, M.D., Dr.P.H. Skin Irritants Report (1926-1934), and Bibliography on Volatile Solvents (Report, 1934-1936), Announced Available.	234
So-Called Inhuman Pound Law in California, The [Antivivisection]. Editorial.	510
Social Security Act, Nutrition Services in Maternal and Child Health Programs Under the. Marjorie M. Heseltine	815
Social Security Act, Progress Under the Operation of Title VI of the. C. E. Waller, M.D.	1298
Social Work and the Physically Handicapped Child in the Development of a New State Program. Dorothy Buckner.	461
Socialized Medicine. See: A Century in Arrears. Abel Wolman, Dr.Eng.	1369
The Case of Public Health vs. Public Welfare. Homer Folks, LL.D.	916
The Health of the Nation. Thomas Parran, M.D., Dr.P.H.	1376
Solotorovsky, Morris, Buchbinder, Leon, Ph.D., and Solowey, Mathilde. Alpha Hemolytic Streptococci of Air.	61
Solowey, Mathilde, Solotorovsky, Morris, and Buchbinder, Leon, Ph.D. Alpha Hemolytic Streptococci of Air.	61
Some Public Health Aspects of Housing. Editorial.	776
Southern Branch, American Public Health Association.	Year Book, 32
Standard Agar Counts as Compared With Counts on Improved Agars at 32° C. M. W. Yale, Ph.D.	148
Standard Birth and Death Certificates. Editorial.	79
Standard Methods:	
Coördinating Committee on Standard Methods. Report of the Chairman, A. Parker Hitchens, M.D.	Year Book, 95
Analyzing Frozen Desserts and Ingredients. Food and Nutrition Chairman, J. H. Shrader, Ph.D., M.D.; Laboratory Chairman, Friend Lee Mickle, Sc.D.	Year Book, 49, 98
Biology of the Laboratory Animal. R. A. Kelser, D.V.M., Chairman.	Year Book, 101
Examination of Dairy and Food Products:	
Bacteriological Examination of Dairy and Food Products. Robert S. Breed, Ph.D., Chairman	Year Book, 102
See: Standard Agar Counts as Compared With Counts on Improved Agars at 32° C. M. W. Yale, Ph.D.	148

Standard Methods—Continued	Page
Examination of Water and Sewage. Water Analysis. John F. Norton, Ph.D., Chairman	Year Book, 118
Diagnostic Procedures and Reagents. William D. Stovall, M.D., Chairman. Year Book, 103	
Recognition and Significance of Hemolytic Streptococci in Infectious Diseases. Evaluation of the Group-Precipitation Test in the Identification of Hemolytic Streptococci Pathogenic for Man. Julia M. Coffey, Referee.	Year Book, 104
Recognition of Pneumococcus Types Associated with Pneumonia. Elliott S. Robinson, M.D., Ph.D., Referee.	Year Book, 108
Serological and Bacteriological Procedures in the Diagnosis of Enteric Fevers. Marlon B. Coleman, Referee.	Year Book, 111
Serological Tests for the Diagnosis of Syphilis. Ruth Gilbert, M.D., Referee.	Year Book, 112
Serological Tests for the Diagnosis of Syphilis. Elizabeth Maltaner, Associate Referee	Year Book, 114
Standard Methods for the Examination of Dairy Products. Changes in New Edition.	
Robert S. Breed, Ph.D., Chairman of Committee.	1447
Standards for Certified Milk, A Critical Discussion of Some Methods and. J. Howard Brown, Ph.D.	1053
Stark, C. N., and Gumsalus, I. C. Formate Ricinoleate and Brilliant Green Bile Broths to Detect Coliform Organisms in Pasteurized Milk.	832
State Cancer Program, A. (Massachusetts.) Henry D. Chadwick, M.D., and Herbert L. Lombard, M.D.	14
State Health Department, Development of an Industrial Hygiene Program in a. H. F. Eason, M.D., and M. F. Trice.	610
State Health Department, Nutrition Program in a. Woodbridge E. Morris, M.D.	718
Statistics, Interrelationship of Health and Welfare Records and. Ewan Clague, Ph.D.	599
Sternberg, George Miller. Editorial.	774
Stillbirth, Problem of the Causes of. Ethel C. Dunham, M.D., Elizabeth C. Tandy, D.Sc., Edwin F. Dally, M.D., and Clara E. Hayes, M.D.	491
Stix, Regine K., M.D., and Wiehl, Dorothy G. Abortion and the Public Health.	621
Stovall, William D., M.D., Chairman. Report of Committee on Standard Methods on Diagnostic Procedures and Reagents	Year Book, 103
Stream Pollution. See Vinson-Barkley Bill. Editorial.	77
"Strength Is Incapable of Effort, Wealth Useless and Eloquence Powerless if Health Be Wanting." [Health Education Campaign in England.] Editorial.	373
Streptococci to Physical Changes Occurring in the Udders of Dairy Cows, The Relation of. Bovine Mastitis. W. T. Miller and H. W. Johnson.	1222
Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass., A. W. G. Smillie, M.D., G. H. Warnock, M.D., and Harold J. White.	293
Suggested Program of Control of Amebiasis by Health Departments, A. Charles F. Craig, M.D.	187
Suicide, An Unusual (by injection of bacilli). Editorial.	1336
Suitable Paper Wrappers and Containers for Foods. J. R. Sanborn.	571
Sullivan, John P., Ph.D. Present Status of Safety Education in Some Representative School Systems	1175
Summer Camps and Roadside Places, Joint Committee on. Trailer Camp Sanitation. Carl E. Green, Chairman.	Year Book, 132
Summer School Courses in Public Health.	682
Supervision of Food in New York City. A. Lichterman, Ph.D.	845
Supervision of Fumigation and Extermination. John Oberwager, M.D.	633
Supplements:	
Annual Index	December
Preliminary Program, Annual Meeting, Kansas City, Mo., October 25-28, 1938. August	
Preliminary Report of the Committee on the Hygiene of Housing, A.P.H.A. "Basic Principles of Healthful Housing." C.-E. A. Winslow, Chairman.	351, March
Year Book, 1937-1938.	February
Survival of E. Typhi in Sewage Treatment Plant Processes. Carl E. Green and Paul J. Beard, Ph.D.	762
Sylvatic Plague. K. F. Meyer, Ph.D., M.D.	1153
Symposia:	
Crippled Child—	
Buckner, Dorothy	464
Carter, Dorothy J., R.N.	458
Crothers, Bronson, M.D.	340
Hilleboe, H. E., M.D.	451
Dairy and Food Products—	
Paper Containers:	
Sanborn, J. R.	571, 576
Tanner, Fred W.	587
Yale, M. W., Ph.D.	148

Symposia—Continued		Page
Gastrointestinal Disorders—		
Gill, D. G., M.B., D.P.H., and McAlpine, James G., Ph.D. (Discussion, C. D. Bowdoin)		741
Hardy, Albert V., M.D., and Watt, James, M.D.		730
Pharris, Crit, M.D., Kittrell, F. W., and Williams, W. C., M.D.		730
Heavy Metals—		
Fairhall, Lawrence T., Ph.D.		825
Neal, Paul A., M.D.		907
Hygiene of Housing—		
Britten, Rollo H.		957
Connolly, Joel I.		954
Mental Hygiene—		
Elkind, Henry B., M.D.		245
Freeman, Allen W., M.D.		241
Hincks, C. M., M.D.		251
Syphilis Control in Industry—		
Crain, Gladys L., R.N.		181
Sayers, R. R., M.D.		155
Schwartz, Louis, M.D.		593
Virus Diseases—		
Baird, R. D., M.D., and Rivers, Thomas M., M.D., Sc.D.		47
Webster, Leslie T., M.D.		44
(See also November, 1937)		
What Every Health Officer Should Know:		
Bristol, Leverett D., M.D., Dr.P.H. (Industrial Hygiene)		1080
Connolly, Mary P. (Health Education)		1083
Deutsch, Naomi, R.N. (Public Health Nursing)		1087
Whitney, Jessamine S. (Vital Statistics)		1077
Syphilis and Gonorrhea, The Role of the Nurse in the Control of. Gladys L. Crain, R.N.		181
Syphilis. See:		
Handicaps in the Normal Growth and Development of Rural Negro Children. Hildrus A. Poindexter, M.D.		1048
Qualifications of a Venereal Disease Control Officer. Thomas B. Turner, M.D.		559
The Case of Public Health vs. Public Welfare. Homer Folks, LL.D.		916
Venereal Diseases.		
Syphilis Control in Industry. R. R. Sayers, M.D.		155
Syphilis Control in Industry. Symposium. See Symposia.		
Syphilis, Investigation of Early. Buffalo, N. Y. William T. Clark, M.D., and Cleland A. Sargent, M.D.		
		807
Syphilis, Rural—A Localized Outbreak. Monroe County, Tenn. R. C. Kimbrough, M.D., D. M. Cowgill, M.D., and E. P. Bowerman, M.D.		
		756
Syphilis, Serodiagnosis of. Editorial.		
		375
Syphilis, Serodiagnostic Tests for.		
		1253
Syphilis, Serological Tests for the Diagnosis of. Reports of the Standard Methods Committee. Ruth Gilbert, M.D., Referee. Elizabeth Multaner, Associate Referee.		
		Year Book, 112, 114
T		
Tabular Outline for Use in Reporting Hospital Morbidity, A. Joseph Berkson, M.D.		
		723
Tarbett, R. E. Federal Facilities to Expedite Emergency Sanitation Measures. (Followed by Discussion, by J. K. Hoskins, C.E.)		
		1091
Tandy, Elizabeth C., D.Sc., Daily, Edwin F., M.D., Hayes, Clara E., M.D., and Dunham, Ethel C., M.D. Problem of the Causes of Stillbirth.		
		491
Tanner, Fred W. Microbial Flora of Paper Containers.		
		587
Teeth. See:		
Dental caries.		
Indiana's Dental Health Program. Howard B. Mettel, M.D., and Mary H. Westfall, D.D.S.		
		949
Teeth (Lost permanent tooth index). See Evaluation of Dental Programs for Children. J. M. Wisan, D.D.S.		
		859
Teeth, Nutritional Influence on. Frances Krasnow, Ph.D.		
		325
Tennessee Town, A Water-Borne Outbreak of Gastroenteritis in a. Crit Pharris, M.D., F. W. Kittrell, and W. C. Williams, M.D.		
		736
Tenure of Office for Health Officers. Joseph W. Mountin, M.D., and Elliott H. Pennell.		
		1311
Thomas, Dorothy Swaine, Ph.D. Determining Population in Intercensal and Postcensal Years by Means of Continuous Population Registers.		
		28
Thompson, Warren S. Population Growth—Its Vital Statistics and Public Health Aspects.		
		1319
Tiek Survey in Iowa, Rocky Mountain Spotted Fever and. Carl F. Jordan, M.D., C.P.H.		
		1411
Tiedeman, Walter von D., Chairman. Milk Supply. Report of the Committee.		
		Year Book, 124
Tiedeman, Walter von Dohlen, M.C.E. Present Status of Phosphatase Test for Pasteurization. (Followed by Discussions, by Paul F. Krueger and Sol Pineus, C.E.)		
		316
Tiedeman, Walter von D., M.C.E., and Hohl, Nelson J., M.S. Improved Laboratory Control of Pasteurized Milk		
		629

	Page
Time-Study of Morbidity and Mortality in the United States Navy, A. John M. Wheelis, Jr., M.D.	1291
Tissue Culture Virus, Experiments on Antirabic Vaccination With. Lester T. Webster, M.D.	44
To Study Relationships Between Official and Nonofficial Public Health Nursing Agencies. Report of the Committee. Miriam Ames, R.N., Chairman.	Year Book, 157
Top, Franklin H., M.D. Measles in Detroit, 1935. I. Factors Influencing the Secondary Attack Rate Among Susceptibles at Risk.	935
Toxoid, Alum Precipitated—for the Prevention of Diphtheria. Archibald S. Dean, M.D., Dr.P.H., and Samuel Hyman, M.D.	1170
Trailer Camp Sanitation. Report of the Joint Committee on Summer Camps and Roadside Places. Carl E. Green, Chairman.	Year Book, 132
Trailer, The Auto. Editorial.	961
Trice, M. F., and Eason, H. F., M.D. Development of an Industrial Hygiene Program in a State Health Department	610
Triehneliasis in San Francisco. M. Hobnauer, M.D., and J. C. Geiger, M.D.	1203
Triehnosis, The Epidemiology of. C. D. Barrett, M.D., and Richard Sears, M.D.	706
Triehomonas hominis. See Gastrointestinal Disorder Not Proved to Be Water-Borne. D. G. Gill, M.B., D.P.H., and James G. McAlpine, Ph.D.	741
Tuberculosis. See Lung Findings in Foundry Workers—A Four Year Survey. O. A. Sander, M.D.	601
Tuberculosis Among Children and Young People in Cattaraugus County, N. Y. John H. Korn, M.D.	167
Tuberculosis, Bovine, in Children. Editorial.	1334
Tuberculosis in Children. See Preventive Aspects of Crippling Diseases. H. E. Hilleboe, M.D.	451
Tuberculosis in the Primate in Laboratories and Zoölogical Collections, Acquired. C. R. Schroeder, D.V.M.	469
Tuberculosis of Bovine Origin, Human. Editorial.	646
Turner, C. E., Dr.P.H., Sc.D., and Nordstrom, Alfred. Extent and Seasonal Variations of Intermittency in Growth	499
Turner, Thomas B., M.D. Qualifications of a Venereal Disease Control Officer.	559
Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass. A Study of a. W. G. Smille, M.D., G. H. Warnock, M.D., and Harold J. White.	293
Typhoid. See The Use of Antityphoid Vaccine During Epidemics. Editorial.	378
Typhoid Carrier Incidence in Mississippi, The Probable. A. L. Gray, M.D., M.P.H.	1415
Typhoid Carriers, Cultural Methods for the Detection of. Elizabeth J. Cope and Joseph A. Kasper, M.D.	1065
Typhoid Fever Attributed to Salad Contaminated by a Chronic Typhoid Carrier, An Epidemic of. Paul A. Lembeke, M.D., and Paul von Haeseler, M.D.	1212
Typhoid Ferer, The Croydon [England] Epidemic of. Editorial.	644
"Typhoid Mary" [Mary Mallou] Dies of Stroke at 68.	1451

U

United States Navy, A Time-Study of Morbidity and Mortality in the. John M. Wheelis, Jr., M.D.	1291
United States Public Health Service. See Federal Facilities to Expedite Emergency Sanitation Measures. R. E. Tarbett. (Followed by Discussion, by J. K. Hoskins, C.E.)	1091
Universities and Colleges. See Public Health Degrees and Certificates Granted in 1937. W. S. Leathers, M.D., Chairman.	863
Unusual Suicide, An (by injection of bacilli). Editorial.	1336
Use of Antityphoid Vaccine During Epidemics, The. Editorial.	378
Use of Dishwashing Machines: Pasteurization of Eating Utensils. Wesley C. Cox, M.D.	174
Utah Public Health Association—New Affiliated Society, A.P.H.A.	1443

V

Vaccination With Tissue Culture Virus, Experiments on Antirabic. Leslie T. Webster, M.D.	44
Vaccine During Epidemics, The Use of Antityphoid. Editorial.	378
Value of the Vital Statistics Data on Birth and Death Certificates in County Health Work. Earle G. Brown, M.D.	1398
Vane, Robert J., Chairman. Accident Statistics. Report of the Committee.	Year Book, 160
Venereal Disease Control. See The Health of a Nation. Thomas Parran, M.D., Dr.P.H.	1376
Venereal Disease Control Officer, Qualifications of a. Thomas B. Turner, M.D.	559
Venereal Diseases. See Gonorrhea: Syphilis.	
Ventilation and Atmospheric Pollution, Committee on. Part I, Working Standards; Part II, Standard Methods for the Examination of the Air; Emery R. Hayhurst, M.D., Ph.D., Chairman. I—Report of Sub-Committee on Physical Procedures in Air Analysis; C. P. Yaglou, Chairman. II—Report of Sub-Committee on Chemical Procedures in Air Analysis; Warren A. Cook, Chairman. III—Report of Sub-Committee on Dust Procedures in Air Analysis: Review and Discussion of Methods of Analyzing Industrial Dusts; J. J. Bloomfield, Chairman. IV—Report of Sub-Committee on Bacteriological Procedures in Air Analysis: Analytic Bacteriological Procedures; William F. Wells, Chairman	Year Book, 81

	Page
Ventilation, Measurement of Sanitary. William Firth Wells and Mildred Weeks Wells.....	343
Veterinary Medicine. See Acquired Tuberculosis in the Primate in Laboratories and Zoölogical Collections. C. R. Schroeder, D.V.M.....	469
Veterinary Medicine, What We Owe to. Editorial.....	193
Vinson-Barkley Bill [Stream Pollution]. Editorial.....	77
Virus Diseases Symposium. See Symposium.	
Visual Education for Schools. Pauline Brooks Williamson.....	278
Vital Statistics and Public Health Aspects, Its. Population Growth. Warren S. Thompson..	1319
Vital Statistics Data on Birth and Death Certificates in County Health Work, Value of the. Earle G. Brown, M.D.....	1398
Vital Statistics Section, A.P.H.A. John Collinson, M.D., Secretary.	
Vital Statistics, What Every Health Officer Should Know About. Jessamine S. Whitney....	107
Vitamin A Deficiency, The Dark Adaptation Test for. Carroll E. Palmer, M.D.....	30
Vitamin D Milk. See Milk and Dairy Products. Report of the Committee. Frederick W. Fabian, Ph.D., Chairman.....	Year Book, 66
Vitamin Milks, Present Status of. E. V. McCollum, Ph.D.....	1069
Vivisection. See The So-Called Humane Pound Law in California. Editorial.....	510
Volatile Solvents, Bibliography on. Report (1934-1936) by Henry Field Smyth, M.D., Dr.P.H., announced available	234
von Haeseler, Paul, M.D., and Lembecke, Paul A., M.D. An Epidemic of Typhoid Fever Attributed to Salad Contaminated by a Chronic Typhoid Carrier.....	1212

W

Wadsworth, Augustus B., M.D. The Laboratory Section of the American Public Health Association. Report of the Archivist.....	Year Book, 92
Waller, C. E., M.D. Progress Under the Operation of Title VI of the Social Security Act..	1298
Walter, Annabel W. Difficulties Encountered in Pneumococcal Type Determination.....	54
War. See:	
Protection Against Poison Gas. Editorial.....	379
Sanitation in the Next War. Editorial.....	374
Warner, Estella F., M.D. Secretary, Child Hygiene Section, A.P.H.A.	
Warnock, G. H., M.D., White, Harold J., and Smille, W. G., M.D. A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass.....	293
Water Analysis. Report on Examination of Water and Sewage (Standard Methods). John F. Norton, Ph.D., Chairman.....	Year Book, 118
Water Analysis, Revised Fuchsin Lactose Broth for the Confirmatory Test in. Cassandra Ritter	616
Water-Borne Outbreak of Gastroenteritis in a Tennessee Town, A. Crit Pharris, M.D., F. W. Kittrell, and W. C. Williams, M.D.....	736
Water-Borne Outbreaks in the United States and Canada, 1930-1936, and Their Significance. Report of the Committee on Water Supply. Arthur E. Gorman, Chairman....	Year Book, 137
Water, Chloramine Treatment of Sea. Lewis V. Carpenter, Lloyd R. Setter, and Morris Weinberg	920
Water, Drinking. See Plumbing in Low Cost Housing. Joel I. Connolly.....	954
Water from Long Stored Feces, Organisms Involved in the Pollution of. Leland W. Parr, Ph.D.	445
Water Supply. Report of the Committee. Water-Borne Outbreaks in the United States and Canada, 1930-1936, and Their Significance. Arthur E. Gorman, Chairman....	Year Book, 137
Watt, James, M.D., and Hardy, A. V., M.D. The Acute Diarrheal Disorders.....	730
Webster, Leslie T., M.D. Experiments on Antirabic Vaccination With Tissue Culture Virus..	44
Wegman, Myron E., M.D. Postgraduate Education of Physicians in Pediatrics.....	1072
Weinberg, Morris, Carpenter, Lewis V., and Setter, Lloyd R. Chloramine Treatment of Sea Water	920
Wells, William F., Chairman. Report of Sub-Committee on Bacteriological Procedures in Air Analysis: Analytic Bacteriological Procedures.....	Year Book, 90
Wells, William Firth, and Wells, Mildred Weeks. Measurement of Sanitary Ventilation....	343
Western Branch, American Public Health Association.....	Year Book, 32
Western Branch, American Public Health Association. Ninth Annual Meeting, Portland, Ore. Editorial	869
Westfall, Mary H., D.D.S., and Mettel, Howard B., M.D. Indiana's Dental Health Program..	949
What Every Health Officer Should Know:	
Health Education. Mary P. Connolly.....	1083
Industrial Hygiene. Leverett D. Bristol, M.D., Dr.P.H.....	1080
Public Health Nursing. Naomi Deutsch, R.N.....	1087
Vital Statistics. Jessamine S. Whitney.....	1077
What We Owe to the Forefathers. Editorial.....	962
What We Owe to Veterinary Medicine. Editorial.....	199
Wheeler, John M., Jr., M.D. A Time-Study of Morbidity and Mortality in the United States Navy	1291
White, Harold J., Smille, W. G., M.D., and Warnock, G. H., M.D. A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass.....	293
Whitney, Jessamine S. What Every Health Officer Should Know About Vital Statistics....	1077
Wiel, Dorothy G., and Stix, Regine K., M.D. Abortion and the Public Health.....	621
Williams, Jesse Felling, M.D. Physique and Health.....	487

	Page
Williams, W. C., M.D., Pharris, Orlt, M.D., and Kittrell, F. W. A Water-Borne Outbreak of Gastroenteritis in a Tennessee Town.....	736
Williamson, Pauline Brooks. Visual Education for Schools.....	278
Wilzbach, Carl, M.D. Secretary, Public Health Education Section, A.P.H.A.	
Winslow, C.-E. A., Dr.P.H., Chairman. Basic Principles of Healthful Housing. Preliminary Report of the Committee on the Hygiene of Housing.....	351
Winslow, C.-E. A., Dr.P.H. Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts.....	1269
Wisn, J. M., D.D.S. Evaluation of Dental Programs for Children.....	859
Wolman, Abel, Dr.Eug. A Century in Arrears. Presidential Address.....	1369
Worcester State Hospital. See A Study of a Type I Pneumococcus Epidemic at the State Hospital at Worcester, Mass. W. G. Smillie, M.D., G. H. Warnock, M.D., and Harold J. White	293
Wright, Edward. Control of Nuisances.....	579

Y

Yaglou, C. P., Chairman. Report of Sub-Committee on Physical Procedures in Air Analysis Year Book,	92
Yaglou, C. P. Sanitary Aspects of Air Conditioning. (Correction, page 546).....	143
Yale, M. W., Ph.D. Standard Agar Counts as Compared With Counts on Improved Agars at 32° C.	148
Year Book, American Public Health Association—1937-1938. Supplement to February, 1938, issue:	
Governing Council, American Public Health Association.....Year Book,	1
Constitution and By-Laws, American Public Health Association.....Year Book,	2
Annual Meetings	9
Presidents of the American Public Health Association.....Year Book,	11
Recognition for Extended Membership.....Year Book,	11
Recipients of the Sedgwick Memorial Medal.....Year Book,	11
Executive Staff	12
Editorial Board, American Journal of Public Health.....Year Book,	12
Publications	12
Section Councils	13
Committee List, 1937-1938	15
Affiliated State Public Health Societies.....Year Book,	20
Western Branch	31
Southern Branch	31
Resolutions Adopted by the Governing Council October 7, 1937.....Year Book,	32
The Health Conservation Contests.....Year Book,	38

Reports of Association Committees

Annual Meeting Committee:

Scientific Exhibits. Homer N. Calver, Chairman.....Year Book,	42
---	----

Reports of Section Committees

Child Hygiene:

Public Health Dentistry. Guy S. Millberry, D.D.S., Chairman.....Year Book,	44
School Health Service. Harold H. Mitchell, M.D., Chairman.....Year Book,	47

Food and Nutrition:

Analyzing Frozen Desserts and Ingredients. J. H. Shrader, Ph.D., M.D., Chairman, Friend Lee Mickle, Sc.D., Chairman (Laboratory Section Committee).....Year Book,	49
Foods (Chemical Contamination of Food). Albert C. Hunter, Ph.D., Chairman.....Year Book,	52

Microbiological Methods of Food Examination (Development of Standard Methods for the Microbiological Examination of Foods). Lawrence H. James, Ph.D., Chairman

Year Book, 56

Milk and Dairy Products. Frederick W. Fabian, Ph.D., Chairman.....Year Book,

66

Nutritional Problems (Extent of Vitamin Deficiency in the United States). D. Breese

Jones, Ph.D., Chairman

75

Industrial Hygiene:

Ventilation and Atmospheric Pollution. Emery R. Hayhurst, M.D., Ph.D., Chairman

Part I—Working Standards

81

Part II—Standard Methods for the Examination of the Air.....Year Book,

82

I. Report of Sub-Committee on Physical Procedures in Air Analysis. C. P.

Yaglou, Chairman

82

II. Report of Sub-Committee on Chemical Procedures in Air Analysis. Warren

A. Cook, Chairman

83

III. Report of Sub-Committee on Dust Procedures in Air Analysis (Review and

Discussion of Methods of Analyzing Industrial Dusts). J. J. Bloomfield,

Chairman

85

IV. Report of Sub-Committee on Bacteriological Procedures in Air Analysis

(Analytic Bacteriological Procedures). William F. Wells, Chairman....

Year Book, 90

Year Book—Continued	Page
Laboratory:	
The Laboratory Section of the American Public Health Association (Report of the Archivist). Augustus B. Wadsworth, M.D.....	Year Book, 92
Progress in and Present Status of Biological Products. Elliott S. Robinson, M.D., Ph.D., Chairman	Year Book, 93
Standard Methods (Coördinating Committee)—Report of the Chairman. A. Parker Hitchens, M.D., Chairman.....	Year Book, 95
Standard Methods on Analyzing Frozen Desserts (Analyzing Frozen Desserts and Ingredients). Friend Lee Mickle, Sc.D., Chairman, and J. H. Shrader, Ph.D., M.D., Chairman (Food and Nutrition Section Committee).....	Year Book, 98
Standard Methods on Biology of the Laboratory Animal. R. A. Kelsner, D.V.M., Chairman	Year Book, 101
Standard Methods on the Examination of Dairy and Food Products (Bacteriological Examination of Dairy Products). Robert S. Breed, Ph.D., Chairman..	Year Book, 102
Standard Methods on Diagnostic Procedures and Reagents. William D. Stovall, M.D., Chairman	Year Book, 103
Recognition and Significance of Hemolytic Streptococci in Infectious Diseases (Evaluation of the Group Precipitation Test in the Identification of Hemolytic Streptococci Pathogenic for Man). Julia M. Coffey, Referee..	Year Book, 104
Recognition of Pneumococcus Types Associated with Pneumonia. Elliott S. Robinson, M.D., Ph.D., Referee.....	Year Book, 108
Serological and Bacteriological Procedures in the Diagnosis of Enteric Fevers. Marion B. Coleman, Referee.....	Year Book, 111
Serological Tests for the Diagnosis of Syphilis. Ruth Gilbert, M.D., Referee	Year Book, 112
Serological Tests for the Diagnosis of Syphilis. Elizabeth Maltaner, Associate Referee	Year Book, 114
Standard Methods on Examination of Water and Sewage (Water Analysis). John F. Norton, Ph.D., Chairman.....	Year Book, 118
Public Health Engineering:	
Bathing Places. Warren J. Scott, Chairman.....	Year Book, 119
Milk Supply. Walter von D. Tiedeman, Chairman.....	Year Book, 124
Sewage Disposal (The Value of Sewage Sludge as a Fertilizer). Langdon Pearse, Chairman. Sewage Works Journal, November, 1937	
Shellfish. L. M. Fisher, D.P.H., Chairman.....	Year Book, 126
Summer Camps and Roadside Places (Trailer Camp Sanitation).. Carl E. Green, Chairman. Trailer House Statistics—August, 1937, September, 1937...Year Book, 132	
Water Supply (Water-Borne Outbreaks in the United States and Canada, 1930-1936, and Their Significance). Arthur E. Gorman, Chairman.....	Year Book, 137
Public Health Nursing:	
To Study Relationships Between Official and Nonofficial Public Health Nursing Agencies. Miriam Ames, R.N., Chairman.....	Year Book, 157
Vital Statistics:	
Accident Statistics. Robert J. Vane, Chairman.....	Year Book, 160
Death Certification. Marjorie T. Bellows, Chairman.....	Year Book, 162
Forms and Methods of Statistical Practice (Age Adjustment of Death Rates). A. W. Hedrich, Sc.D., Chairman	Year Book, 164
Yellow Fever, The Airplane and. Editorial.....	1110

Z

Zoölogical Collections, Acquired Tuberculosis in the Primate in Laboratories and. C. R. Schroeder, D.V.M.	469
--	-----

